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Journal of the American Medical Association.

EDITED FOR THE ASSOCIATION BY N. S. DAVIS.

PUBLISHED WEEKLY.

VOL. III. CHICAGO, JULY 26, 1884. No. 4.

ORIGINAL ARTICLES.

ON THE CLINICAL STUDY OF THE HEART SOUNDS.

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Read to the Section on Practice of Medicine and Materia Medica, of Am. Med. Association, May, 1884.

The volume of the transactions of the American Medical Association for 1858, contains a prize essay by me on the "Clinical Study of the Heart-Sounds in Health and Disease." The term heart-sounds in this essay, used in its conventional sense, was limited to the normal sounds of the heart, and their abnormal modifications, the term, as thus limited, not embracing adventitious sounds, these being distinguished as heart murmurs. The following quotation is from the introductory remarks in that essay: "The clinical study of cardiac affections, which has been prosecuted of late years with so much assiduity and success by observers in different countries, has had reference more especially to the murmurs. On the normal sounds and their abnormal modifications, comparatively small attention has been bestowed. In the course of investigations, having reference to the diseases of the heart, I have been led to think that these sounds have not hitherto received that consideration which their importance claims. Impressed with the belief that a field for clinical research is here open, which requires only proper cultivation to yield results, possessing not only interest, but much practical utility as regards our knowledge of the heart in its physiological and pathological relations, I have for some time been engaged in inquiries directed to the subject. My design in this essay is to contribute the fruits of my researches, and to indicate some of the questions which are to be satisfactorily settled by an accumulation of facts developed by clinical observation."

This quotation is not entirely inapplicable to the subject at the present time. After twenty-six years, it may still be said that here is a field for clinical study not yet fully cultivated, and that the heart-sounds do not now receive at the hands of medical practitioners a consideration commensurate with the importance of their practical bearings. My object in this paper is to supplement the essay to which I have referred, by the results of some further study of the subject, with a view, more especially, to bring it again to the attention of clinical observers.

It is customary to consider the heart sounds as consisting of two in number, to wit: the first or systolic, and the second or diastolic sound. For convenience in regard to clinical study, it seems to me desirable to recognize five distinct sounds, two of which are diastolic, and three systolic.

The two diastolic sounds are referable, respectively, to the aortic and the pulmonic orifices of the heart. They may be studied separately, as is now generally admitted, by auscultating with the stethoscope, at the left and at the right second intercostal space close to the sternum. These two sounds may be called simply the aortic and the pulmonic.

Of the three systolic sounds, one emanates from the mitral, or the left auriculo-ventricular, and another from the tricuspid, or the right auriculo-ventricular orifice. The third systolic sound has no connection with the orifices of the heart, but is produced by the impulsion of the organ against the thoracic wall. These three sounds may be designated the mitral sound, the tricuspid sound, and the sound of impulsion. The facts stated in my prize essay in 1858 seemed to me then, and they seem to me not less now, to demonstrate the existence of these three distinct elements of the so-called first sound of the heart, and that each may be studied separately. I refer to the essay for the facts, not reproducing them in this paper. I will, however, state where the three sounds are to be separately studied.

Auscultating with the stethoscope (the binaural is to be preferred) over the apex, the intensity, the greater length and the distinctive quality, (which may be called booming[1]) of the so-called first sound, as compared with the second sound, (the pulmonic and aortic sound combined) are due to impulsion, that is, the movements of the apex upon the thoracic wall. The sound of impulsion is, therefore, to be studied in this situation. As a rule, this sound does not extend beyond a limited area around the apex. The mitral sound is heard, distinct from the sound of impulsion by moving the stethoscope to the left of the apex in the fourth intercostal space, for a distance sufficient to eliminate completely those characters of the so-called first sound which are referable to impulsion. The maximum of the intensity of the mitral sound is at the situation where the characters of impulsion are eliminated, and generally this situation is but a little removed to the left of the apex-beat. The tricuspid sound is heard distinct from the sound of impulsion, at the interior border of the heart, above the

[1] The word *booming* was applied by Walshe to the distinctive quality of the first sound as heard over the apex. This now has been applied, but inappropriately to the second sound.

xiphoid cartilege. Its maximum of intensity is at the situation where the characters of impulsion are eliminated[1].

Not going further into details relating to the existence of the five sounds, and the manner in which they are to be studied separately, I proceed to offer remarks on the clinical study of each one of these sounds under a distinct heading.

1. *The Aortic Sound.*—Incompetency of the aortic valve is generally, if not invariably, separated by a regurgitant murmur. It will, however, be admitted that this murmur, whatever may be its intensity and its characters in other respects, is, in itself, evidence only of the fact of incompetency. The murmur furnishes no criteria for determining the extent to which the valve is damaged. The incompetency may be so slight as to be innocuous, or it may be either small, moderate or great. Information on these points is furnished by either the unaffected intensity of the aortic sound, or the degree of its diminished intensity, and, in some instances, its absence. The importance of the study of the aortic sound, with reference to the gravity, or otherwise, of aortic lesions, is recognized now more than it was twenty-six years ago; but it is still inadequately appreciated by many practitioners. The abnormal weakness of the aortic sound may be estimated by comparison with the pulmonic sound, if the latter be neither intensified nor weakened by morbid conditions pertaining either to arterial tension of the pulmonary artery, or to an increased or diminished power of the right ventricle. A more reliable comparison is with the power of the left ventricle as represented by the sound of impulsion and the apex-beat. The co-existence of increased power of the left ventricle with notable feebleness or absence of the aortic sound, is especially significant as denoting considerable or great damage of the aortic valve.

Murmurs are sometimes spoken of as if they were modifications of the heart-sounds. The latter are always distinct from the former, the murmurs being either added to, or replacing the sounds. If the aortic sound be present, owing to its distinctive valvular quality, it may be recognized, notwithstanding the intensity or other characters of an associated murmur. Rarely, if ever, is the sound drowned by a murmur, however loud or rough, or musical.

The aortic sound is weakened by other causes than lesions affecting the aortic valve. Weakness of this sound is proportionate to the diminution of blood sent into the aorta with the systole of the left ventricle, in consequence of either mitral obstruction or regurgitation, or of both combined. The significance of weakness of this sound is greater in proportion as it is in contrast with the force with which the left ventricle contracts. As evidence of the degree of obstruction or of regurgitation, or of both combined, weakness of the aortic sound, although more regarded now than twenty-six years ago, does not as yet receive the attention which its clinical importance claims.

Abnormal increase of the intensity of the aortic sound is referable to two causes, namely: increased power of the systole of the left ventricle, and increased blood-pressure or tension of the systemic arteries. With regard to the first of these causes, there can be no question as to its agency. Abnormal loudness of the aortic sound is a sign of hypertrophy of the left ventricle, and, to a certain extent, a criterion of its degree, assuming, of course, integrity of the aortic and the mitral valve. Attention has of late been directed especially to an increased intensity of this sound as a criterion of arterial tension, and this latter condition, at the present time, holds an important place in pathology. Clinical observations have led me to distrust the value which some observers appear to attach to the intensity of the aortic sound as evidence of arterial tension. The intensity of this sound varies considerably in different healthy persons. Its relative intensity, as compared with the pulmonic sound, in health, is variable. Exceptionally it is less intense than the pulmonic sound.[1] It is certain that in some cases in which arterial tension is supposed to be an important pathological element, namely, in cases of contracted kidneys, the intensity of the aortic sound is not increased.

The following case is illustrative of this fact:—A patient, about 50 years of age, had had three attacks of uræmic convulsions. The quantity of urine was large, of low specific gravity, slightly albuminous, and contained hyaline and granular casts. He had no œdema except slightly below the eyes. The heart was a little enlarged, and there was no cardiac murmur. The pulmonic sound was distinctly louder than the aortic, the difference in pitch showing that the louder sound was the pulmonic and not the aortic.

In this instance, arterial tension was to be inferred, but, notwithstanding slight enlargement of the heart, and the absence of any evidence of a pulmonary affection, the aortic sound was apparently not increased in intensity.

The recent experiments by Dr. Charles L. Roy, reported in the *London Lancet*, Jan. 26, 1884, show that abruptly cutting off the supply of arterial blood to considerable portions of the body, by ligating large arteries, produces but an extremely slight effect upon the blood-pressure or arterial tension.

Reliance on the intensity of the aortic sound, irrespective of hypertrophy of the left ventricle, as evidence of arterial tension, or on the weakness of this sound as evidence that arterial tension does not exist, must, as it seems to me, lead to erroneous conclusions.

2. *Pulmonic Sound.*—Forty or more years ago, Skoda called attention to an increase of the intensity of the pulmonic sound as a sign of hypertrophy of the right ventricle, in cases of mitral lesions involving

[1] To obtain the maximum of intensity of the mitral and the tricuspid sound, the stethoscope is to be moved gradually from the borders of the heart until the sound becomes purely valvular, that is until the characters which belong to impulsion are eliminated. It is easy to find the situations where the purely valvular sounds have their maximum. These situations vary somewhat in different persons in health, and still more in cases of disease. To designate certain circumscribed places as mitral and tricuspid ones, as is done by some writers, is therefore inaccurate and leads to error.

[1] In these exceptional instances, the relatively less intensity of the aortic, as compared with the pulmonic sound, may be due to a transient excitement of the heart's action. As will be stated under the head of the pulmonic sound, the intensity of this sound is greater than the aortic when the heart is functionally excited.

either obstruction or regurgitation, or both combined. The intensity of the pulmonic sound is undoubtedly increased by hypertrophy of the right ventricle, but there is another and perhaps a more important factor in the production of this sign, to which attention has been more recently directed, namely, increased blood pressure within the pulmonary arterial system. That notably increased intensity of the pulmonic sound may be due to this factor, irrespective of hypertrophy of the right ventricle, is certain—a fact which explains the persistence of the sign after the right ventricle, in connection with mitral lesions, has become weakened by dilatation.

The pulmonic sound is more or less intensified whenever there is obstruction to the free circulation of blood through the lungs, the co-existence of hypertrophy of the right ventricle not being essential. It is a sign present in cases of pneumonia, capillary bronchitis, asthma, pulmonary œdema, pleurisy, with effusion and hydrothorax. To a certain extent, the degree of increased intensity may be taken as a criterion of the amount of obstruction.

Increased functional activity of the heart intensifies the pulmonic, more than the aortic, sound. The greater intensity of the pulmonic sound is referable chiefly to increased blood pressure within the pulmonary arteries. When the heart is excited by either active exercise or a moral emotion, the pulmonic sound is especially intensified. More blood is propelled into the lungs than can readily pass through the capillaries. If the accumulation of blood in the pulmonary vessels exceed a certain limit, there is dyspnœa; but within this limit the blood pressure is sufficient to intensify the pulmonic sound.

I am not prepared to say how much significance pertains to diminished intensity of the pulmonic sound, as a sign of tricuspid regurgitation, or of the very rare lesions causing tricuspid stenosis, and, also, of weakness of the right ventricle from dilatation or from fatty degeneration. My colleague, Professor Janeway, has called my attention to the frequent absence of the pulmonic sound when, from lesions at the aortic orifice, the aortic sound is abolished. I am not prepared to explain this clinical fact. Of course, damage or destruction of the pulmonic valve must either diminish the intensity of the pulmonic sound or abolish it; but lesions producing these effects are so rare, that the clinical study of this sound, in connection therewith, is not easily pursued, and has but little practical importance.

3. *Mitral Sound.*—The mitral sound, disassociated from the sound of impulsion, is short and purely valvular, like the pulmonic or the aortic sound. Its intensity varies considerably in different healthy persons.

Insufficiency of the mitral valve is represented by a murmur, which, like an aortic regurgitant murmur, simply denotes the existence of lesion, without giving information concerning the importance of the lesion, that is, whether the regurgitating volume of blood be small or large. An abnormal weakness of the mitral sound and its absence, are signs which supply, in a measure, this information. These signs thus have a practical value in connection with mitral lesions. This statement applies equally to mitral regurgitant and to mitral obstructive lesions. Weakness or absence of the mitral sound associated with either a mitral diastolic or a presystolic murmur, shows that the obstructive lesion either interferes to a greater or less extent, or abolishes the valvular movements which produce the sound.

Exclusive of mitral lesions, the mitral sound may be weakened in consequence of feebleness of the systole of the left ventricle from dilatation or fatty degeneration. Overfilling of the left ventricle as a consequence of aortic regurgitation, has the same effect, irrespective of the force with which the left ventricle contracts. The explanation is, that, under these circumstances, the excursion movements of the mitral curtains may be slight or *nil*, owing to the fact that at the time of the ventricular systole they are not only floated away from the inner surface of the ventricular wall, but are closely in coaptation with each other. When this is the case, the tension of the curtains produced by the pressure of the intra-ventricular blood in the systole, occasions little or no sound.

The intensity of the mitral sound, of course, other things being equal, is proportionate to the extent of the excursion movements of the mitral curtains. If the stethoscope (binaural) be placed directly upon the heart of an animal of considerable size, (*e. g.*, the sheep), the circulation being maintained by artificial respiration, the mitral and the tricuspid sounds are extremely loud and purely valvular, that is, without any sound of impulsion. Both the mitral and the tricuspid sounds have somewhat of a similar intensity in certain cases of anæmia when the heart is excited by exercise or mental emotion. The explanation, as I suppose, relates to the comparatively small quantity of blood within the ventricle when the ventricular systole takes place, together with the quickness and force with which the ventricle contracts.

All who are familiar with the mitral presystolic murmur, must have remarked an intensity of the sound which occurs at the termination of the murmur, that is, the mitral sound. This presystolic murmur, with the rough, vibratory character which it usually has, I believe denotes adherence of the mitral curtains to each other, leaving a botton hole-like contraction, the mitral curtains remaining flexible. Now, owing to the contracted orifice, the left ventricle, at the time of its systole, is poorly supplied with blood. The movements of the mitral curtains, which I have called the excursion movements, are considerable and the curtains remaining flexible, the conditions are favorable for intensity of the mitral sound. Contrary to the statements generally made by writers, a mitral regurgitant murmur, under these circumstances, is not infrequently wanting. If a mitral regurgitant murmur be present, and the mitral sounds have a notable degree of intensity, it is certain that the regurgitant stream of blood cannot be large, or, in other words, the mitral incompetency is not great.

4. *Sound of Impulsion.*—In healthy persons the sound of impulsion generally predominates over the mitral and the tricupid sound, at the apex and over

the body of the heart. The intensity of this sound varies much in different healthy persons. The abnormal modifications of this sound are, increase of its intensity, on the one hand, and on the other hand, either diminished intensity of the sound or its absence. It is to be noted that this sound is not like the valvular sounds endocardial but exocardial; and, like the exocardial murmurs, however loud the sound may be within the præcordia, it is not transmitted beyond the præcordial region. As we can imitate a pericardial friction murmur by placing the palm of the hand over the ear and rubbing gently the dorsal surface of the hand with the finger, so we may imitate the sound of impulsion by pushing the finger with more or less force instead of rubbing gently; and by light percussion with the finger, the sign, known as metallic clic (*tintement metallique*), is perfectly imitated.

It is the increased intensity of the sound of impulsion which gives to the first of the two heart-sounds (as they are commonly reckoned), its loudness, its length, and its booming quality, in cases of cardiac hypertrophy. The sound of impulsion predominates over the mitral sound, whereas, the latter is intensified and predominates when the action of the heart is functionally excited.

Diminished intensity of the sound of impulsion is denoted by diminution of the length and of the booming quality of the so-called first sound of the heart, the mitral sound predominating. The sound of impulsion is lost when the mitral sound is alone heard over the apex and body of the heart. Diminution and extinction of this sound, are signs of weakness of the vertricular systole from dilatation, fatty degeneration and the softening incident to certain infectious diseases. Clinical observers long since attached practical value to these signs, but their importance is perhaps not yet sufficiently appreciated by practitioners in general. Their value in the treatment of fever as bearing on the use of alcoholics and other cardiac stimulants, were especially emphasized by Stokes.

Removal of the heart from contact with the chest wall, in cases of pericarditis with effusion, abolishes the sound of impulsion, the mitral and the tricuspid sound alone accompanying the ventricular systole; and when the sound of impulsion is wanting, as a rule the aortic sound at the apex is louder than the mitral. The sound of impulsion is inappreciable in listening to the fœtal heart; the so-called first sound is short and valvular like the second sound.

5. *Tricuspid Sound.*—Weakness and the abolition of the tricuspid sound in consequence of lesions affecting the tricuspid valve and orifice, are not signs of much practical value, owing to the infrequency of lesions in this situation.

Enfeebled action of the right ventricle from fatty degeneration, must occasion abnormal weakness of the tricuspid sound. A thrombus of considerable size formed within the right ventricle, may weaken and extinguish this sound. When the right ventricle is overfilled with blood at the time of the ventricular systole, the tricuspid sound must be weakened, for the same reason that the mitral sound is weakened when the left ventricle is overfilled.

Hypertrophy of the right ventricle intensifies the tricuspid sound. This is a better sign, by far, of hypertrophy of the right ventricle, than an increased intensity of the pulmonic sound, inasmuch as the latter involves, as an additional factor, increased blood pressure within the pulmonary vessels. In the rare instances of notable hypertrophy of the right ventricle resulting from congenital stenosis at the pulmonary orifice, the tricuspid sound must be considerably intensified. While I am writing, I have before me a specimen in which the pulmonary orifice is contracted to the size of a goose-quill. The right ventricle is hypertrophied, so that its walls are as thick as those of the left ventricle in healthy subjects, and the walls of the left ventricle are not much thicker than those of the right ventricle in healthy subjects, the normally relative size of the two ventricles being thus reversed. The tricuspid valve is normal. The specimen was from the case of a patient, aged 19 years, who died of scarlet fever, and who complained of no subjective symptoms denoting cardiac disease, except panting on active exercise. A very loud systolic murmur had been observed, and it was supposed to be a mitral regurgitant murmur. The patient was not under my observation, but it is certain that the tricuspid sound must have been much intensified; and this sign, taken in connection with the probable absence of the pulmonic sound, inasmuch as the segments of the pulmonic valve were perfectly rigid, would have been valuable as indicating the true seat of the valvular lesion.

In conclusion, the chief object of this paper, as stated at the outset, is to bring again, after the lapse of twenty-six years, to the attention of the profession, the importance of the clinical study of the heart-sounds, as distinguished from the heart-murmurs. As a motive for the preparation of the paper, I confess a desire to refer to my essay to which was awarded a prize by the American Medical Association at the meeting in Washington in 1858. I believe I may assume to have been, at that time, a pioneer in the clinical study of the heart-sounds in health and disease. This study, since that date, has not received from writers and practitioners that attention which its importance claims. If I mistake not, the majority of those who avail themselves of the information to be obtained by auscultation, do not take pains to interrogate separately the sounds emanating from the heart, but, for the most part, limit their auscultatory observations to the murmurs. In the latest French work on the diseases of the heart, published in 1883, the heart-sounds are hardly recognized as furnishing any important signs in diagnosis.[1] Having said this, I would add that in the German work on pathology and therapeutics by Eichhorst, published in 1883, and in the article by Guttmann in the Real Encyclopædia, 1881, abnormal modifications of the heart sounds are fully recognized among the data for the diagnosis of cardiac affections. I do not doubt that the time will come

[1] Traité clinique et pratique des maladies du cœur, per Michael Peter. Paris, 1883.

when all clinical observers will consider the practical information to be derived from the heart sounds as not less essential than that furnished by the murmurs, taken in connection with the signs obtained by percussion and palpation.

DISCUSSION.

Dr. Richard McSherry, of Baltimore, Md., said: Mr. Chairman: As an indication of changes in medical acquirement, I may say that when I was a student of medicine in Philadelphia—not very recently—I heard a distinguished professor say he knew nothing of diseases of the heart. The gentleman was very distinguished, certainly not less known to fame, in his day, than his successor, the present honored president of our great Association, but he had not kept up with the progress of his time, for even then the works of Arenbrugged, Corvisart, and Lænnec had taught new and important lessons to the medical world, with which the rising doctors were quite familiar. They at least could not afford to cast ridicule on the "conjuring rod," as the stethoscope was derively called by some of the "Conscript Fathers" of the profession.

The pulse had been the pre-eminent guide, especially in accordance with the teachings of Bordeu and his followers, from whose investigations and speculations, our fathers were led to believe that through it, they could not only take the measure of the circulation, but that it was a gauge of all diseases in all their modifications. Sphygmics, without the aid of the sphygmograph, had almost the attention since given to auscultation and percussion. The learned doctor of the last century, with watch in one hand while the fingers of the other rested on the radial artery, seemed to find in the throbbing of the artery as reliable an indication of the condition of his patient as of the time of day from the hands of his ponderous time piece.

Now the pulse was, and is, a good indicator, but yet like any other one source of information in regard to the vital machine, it may lead to many fallacies, so many, that its real importance came to be underestimated.

Our great master, Lænnec, attached little importance to it by reason of its great uncertainty, saying the ignorant could deduce from it all sorts of indications, while the cleverest could get from it but equivocal conjectures. In truth we know it may deceive us, taken alone, therefore we only rationally use it in conjunction with various other indices of physiological or pathological conditions. It used to be, more than now, a guide in regard to blood-letting, but an improved acquaintance with the central organ of the circulation showed sometimes a strong pulse with a weak heart, and again a vigorously acting heart with a weak pulse (*fictitiè debilis*) and it is from the state of the central organ, and not from the action of the arteries, that we may draw conclusions, *pro* or *con*, in regard to depletion.

We can herein find a scientific guide to practice more reliable than the empirical.

We may now begin to contrast the acquirement of the professor of the earlier half of the century, with that of the professor of the latter half, the one declaring that he knew nothing of the diseases of the heart, the other showing that no diseases of any other organ or viscus are subject to equally exact diagnosis. I know of no more striking evidence of the progress of medical science.

But although diagnosis is practicable, it is still environed with difficulties. We cannot get patients to correspond exactly with elastic models, which represent one age, one size, and average chest walls. Of two successive patients, one may be an enormously fat elderly lady, and the next a slim youth whose chest walls have but a fraction of an inch between the ear of the auscultator and the heart of the patient.

There are so many accidental perturbating causes, too, to make diagnosis not impossible but difficult. This may be particularly perplexing when there is great functional disturbance with an early stage of organic disease. I was called, a few years ago, to Mrs. S., from New York, at a Baltimore hotel, who had come to reside in our city. I found the lady suffering with great dyspnœa, due to pulmonary congestion with evidences of mitral insufficiency and regurgitation. She appeared to be alarmingly ill. She had passed the menopause by some months as I learned upon inquiry. I prescribed according to the needs of the case, and when questioned by some lady boarders upon leaving the house, I spoke of disease of the heart. In a day or two she was greatly relieved, but in the meantime there occurred a flow rather to be called metrorrhagia than menorrhagia. The great general perturbation subsided rapidly, and upon its subsidence the heart's action showed comparatively little disturbance. I heard from some friends afterwards that my diagnosis had been hardly commented on by the inquisitive critics of the house. I soon lost sight of the lady, who took another medical attendant. About two years subsequently, I saw announced in the morning papers the sudden death of Mrs. S., after a few hours' illness. Whether there was another pulmonary congestion or other cause of death, I never learned, nevertheless I could not doubt that organic disease of the heart was the efficient cause.

It appears, according to Porah's statistics, that in gravido-cardiac disorders, as they are called, more than two-thirds of the cases are those of mitral stenosis, mitral insufficiency, or the two combined. Women affected thus are in great peril from pregnancy and child bearing, and they are advised to refrain from marriage.

"Landouzy mentions the case of a young girl who had been in the hospital under his care, and whom he had advised not to marry, but who disregarded his advice, married, became pregnant, and after a miscarriage, died suddenly in an attack of asystole." (*Medical News, April 19, 1884.*) In Mrs. S.'s case, although the mother of several children, I presume the perturbation of her general organism was equivalent to that of pregnancy and miscarriage.

We have anæmia (spanæmia) modifying heart sounds, thus it is urged that an elastic contraction of

the orifice of the aorta in anæmic subjects causes a morbid systolic sound at the base of the heart, where no valvular disease can be detected upon post-mortem examination.

Childhood and old age produce their modifications. The evidences of hypertrophy and dilatation are often observed in growing children, which may pass away entirely about the time of puberty, a fact observed by Laennec, and which, from his own observation, induced Dr. Flint to urge caution in regard to giving a prognosis unfavorable and alarming in such cases.

The sharp accentuation of the second sound without valvular disease, or any disease, except in some remote organ, is a matter of perpetual observation. In one of our dispensary patients, but a short time ago, this sign led to an examination, *inter alia*, of the state of the kidneys. A moderate attack of nephritis, with albuminuria, was soon detected, and soon relieved. The cure of the primary disorder corrected the morbid heart sounds which had caused investigation as to the seat of remote disease.

Old age and deep-seated infirmities greatly modify sounds and impulse. I shall never forget my surprise, in my early professional life, upon finding a greatly enlarged heart upon the post-mortem examination of an old man-of-war's man, whom I had seen a few days before death without diagnosticating such degree of hypertrophy.

Upon referring to the text which was then my guide, I found the following explanatory passage:

"The heart's impulse in hypertrophy and dilatation is almost lost in some cases of pleurisy, asthma, œdema of the lungs, or of congestion before death." (*Laennec*). The modifying conditions were all there, and as I had had no opportunity of tracing the progress of disease with the patient, but only saw him when near his end, the oversight seemed comparatively pardonable.

Besides the proper heart-sounds, it may not be amiss to refer to sounds induced by the heart's action indeed, but extraneous. Thus, the clinician often notices puffs or whiffs, heard when the contraction of the ventricles forces air out of the portions of lung lying between the heart and the thoracic walls.

There is a condition in which all of the five normal sounds may be heard, but not in the right place. I had an opportunity of seeing, a little more than a year ago, a case of dexio-cardia under the care of my friend, Prof. Chew, at the University of Maryland Hospital.

This was an illustrative case of traction from the left to the right side. The patient, a sailor, had been under my care some months previously with effusion in the right pleura, and moist râles in the right lung. The heart was not then displaced. When subsequently re-admitted into the hospital, on inspection, the intercostal spaces on the right side were depressed, the ribs drawn together, and the lower part of the chest wall sunken in. Measurement showed that the semi-circumference of the thorax was one inch less on the right than on the left side. The impulse of the heart could be seen and felt near the right nipple, the apex beat being a little to the right of the mammary line. There was perfect dullness on percussion when I use thed hammer and pleximeter over the right side; respiratory murmur was replaced on that side by subcrepitant and bronchial râles audible as far as the base of the chest, and at two points the sounds indicated the formation of vomicæ. On the left side there was a somewhat exaggerated percussion note, and the respiratory murmur was harsh and puerile, though intermingled to some extent with moist râles. * * * * Reasoning then by the power of exclusion, we have remaining as the most probable cause of the phenomenon that to which I think it should be assigned, viz.: the contraction of the right lung and right pleura, the lung being adherent to the chest wall; and as it had undergone contraction, together with the thickened pleura it had drawn upon the mediastinum, and thus effected the displacement of the heart. (For the full account of this rare and interesting case see Prof. Chew's report in Trans. Med. and Ch. Faculty of Md., 1883.)

Every one has probably heard various neurotic (perhaps sometimes choreic?) sounds different from any ordinary physiological or pathological sounds which are difficult to express or to explain. Among these anomalies, one gentleman informs us that he has heard with a robust and nervous girl over the heart above and to the left, a noise very like the clucking of a young chicken, synchronous with the systole. The sound was loud enough to be heard by the bystanders.

In the case of a vine-dresser, an ex-soldier, at 41, there was a hard intermittent sound in the precordial region, not coincident with the systole, loud enough to mask all the normal sounds of the heart, and to be heard at some metres from his person. It began suddenly about a month before the examination. The man thought some living animal had taken up its abode within his chest. The nearest approach to the sound that the auscultator could suggest would be expressed by the lettres grrouou, 75 times in a minute, in a low but harsh childish voice.

No change was made by acceleration or suspension of the respiration.

The reporter of these two cases attempted no explanation, saying that such phenomena would have to be classed with so many others of a transient nervous, or anomalous character, which are never explained even by autopsy. (*Dictionnaire Annual* 1867, from *Jour. de Med. de Brux. par M. Putégnat.*)

Mr. Chairman, when I consented to make remarks upon Prof. Flint's paper, which he was to offer to this Section, I knew perfectly well that little room would be left for addition or subtraction by commentators. This must be my apology for a rather free handling of the subject, instead of adhering closely to the text presented by so eminent an authority.

Dr. J. S. Lynch, of Maryland, referred to the importance of alteration of the aortic sound in Bright's disease. He thought that a large part of the booming character of the first sound was due to the vibration of the aortic walls at each systole of the heart. He could not understand why increase in the blood pressure in the large arteries should not increase the intensity of the aortic sound. Dr. F. had stated

that the intensity of the pulmonary sound was increased by increase of blood pressure in the pulmonary arterial system. Why should not the same result follow increased pressure in the systemic arteries?

Dr. Garland, of Massachusetts, stated that it was often difficult to decide whether a murmur was coincident with, or replaced the cardiac sound. This is important to decide in diagnosis. He spoke of the importance of getting rid of the respiratory movements in trying to determine this point. A murmur will sometimes disappear when the breath is held for a moment. A deceptive murmur is sometimes heard at the base of the heart, to the right or the left of the sternum and up and down its border. It is systolic in time. The peculiarity of this murmur is that it disappears on full inspiration.

Dr. Donaldson thought it a question whether or not the impulse of the heart could produce a sound. Muscular contraction does not produce a sound, or at least not of sufficient force to be heard without very delicate instruments. Experiments have shown that the first sound is produced by the closure of the mitral and tricuspid valves. Where these have been prevented from closing the sound has been absent. In regard to presystolic murmurs, Dr. Leamy, of New York, has claimed with much plausability that they are not really presystolic, but that they occur at the beginning of the systole.

Dr. Flint in concluding the discussion, said that many of the points advanced were in reference to the mechanism of the sounds and in regard to murmurs. These he had not touched on in his paper, and therefore he waived any consideration of them at this time. His paper was concerned solely with the clinical aspects of the heart sounds. In regard to the Germans having taught the subject in the same manner as he did, he would call attention to the fact that 26 years ago he had pointed out this plan. He could not explain why the blood pressure acted differently in the pulmonic and systemic arteries, but such appears to be the fact.

THE MULTIPLE WEDGE PRINCIPLE IN THE TREATMENT OF ORGANIC STRICTURES OF THE URETHRA.

BY JNO. S. COLEMAN, M.D., AUGUSTA, GA.

Read before the American Surgical Association, Washington, D. C., May 2nd, 1884.

It is now nine years since I published, in the *Medical Record* of New York, my application of the multiple wedge principle to the treatment of organic strictures of the urethra.

To quote from that paper: "It ought to be a self-evident proposition, that it is easier to introduce singly the component parts of a wedge, than to introduce it as a whole. Take, for example, a No. 12 conical bougie, even capillary at its point, and attempt to introduce it into a stricture: Where is the point of friction and resistance? Is it not around the entire circumference of the stricture? Diminish the size of the instrument, and in a direct ratio, you diminish the amount of resistance. After having passed into a stricture one of these whalebone guides, the second has to overcome the friction and resistance of but half the circumference of the stricture, and the line of contact with the other bougie. Now that we have passed these two, we have a groove in front and behind them through which we can readily pass the third and fourth, having now to overcome the resistance of but one-fourth the circumference of the stricture and the two lines of contact with the instruments already in position."

Since that time, I have treated by this method some twenty-five or thirty cases with invariable success. There was not, in any case, marked febrile disturbance; but in some few cases there was sufficient constitutional irritation to cause me to suspend the treatment for a day or two.

It is my habit to give, as a prophylactic, full doses of quinine, say fifteen to twenty grains per day.

I will give in detail one case, as it fully illustrates my method.—Capt. H. D. F. presented himself for treatment of a stricture of twenty years' duration.

His urine was always voided with difficulty, and the act usually consumed from twenty to thirty minutes of his time.

There was marked cystitis, as evidenced by the abundant mucus and the decomposition of his urine. The fetor of his urine was so great as to necessitate the immediate removal of the "pot de chambre." His strictures had been ruptured twice during the year 1866, and once in 1867, with Holt's divulsor.

Since the last operation, he had wholly neglected himself. March 16, 1879, after a prolonged and tedious effort, I succeeded in *worming* through his stricture one of the smallest-sized French filiform bougies, and securely tied it in *situ*. Five days afterwards I succeeded in introducing a second by the side of the first, but the cicatricial tissue was so dense and unyielding, that it was not until the fifteenth day that I could pass the third.

On the twenty-fifth day I readily passed the fourth and fifth bougie.

On the twenty-eighth day I introduced the sixth.

At no time was there any hindrance to the passage of the urine.

Feeling assured that now the caliber of the urethra would admit a good-sized instrument, I attempted to remove the bundle of filiforms. In this I was disappointed, for a sufficient amount of concretion had formed to prevent their removal *en masse*. The string binding them together was cut, when they were readily removed, until the last (the first one introduced) which required some little force to withdraw it. Three inches of its distal end had been covered by a *phosphatic* concretion. About one-half the deposit had slipped off the bougie in its withdrawal. (In subsequent cases I have obviated this *contretemp* by removing from time to time those first introduced and replacing them by new instruments).

My patient was now so nervous that he would not permit me to use a sound.

On the twenty-ninth day, retention of urine having

occurred, the patient was chloroformed and a No. 9 steel sound (American scale) readily passed until it reached the prostatic urethra, where it was arrested by the calculous mass. With a little force it easily entered the bladder. To prevent the possibility of another stoppage, to still further cause the *absorption* of the cicatricial material, and for the purpose of irrigation, I now introduced and tied in a No. 16 Nelaton catheter. Twice daily, a solution of salicylic acid and quinine was injected into the bladder, thoroughly washing it out.

On the thirty-eighth day No 16 was removed, and No. 18 introduced and kept in place four days.

Steel sounds were now passed, from time to time, until the urethra was dilated up to No. 30 of the French scale. The concretions left in the bladder were all extruded within a week. (These specimens, together with the bougie, are here presented).

The patient was instructed to pass, from time to time, a large-sized sound.

It is now five years since Capt. F. was under treatment, and there has not been, so far as I know, a single symptom of a return of his disease. I know that many of my associates will object to the multiple wedge because of its tediousness.

I claim for it safety, certainty, and a greater immunity from a return of the disease, than by any other treatment known to me. Also that it will obviate the necessity for divulsion, internal or external urethrotomy. My reasons for not accepting any of the above operations are: First; that they subject the patient to an unnecessary risk of life. Second; that in internal urethrotomy from behind forwards, it is necessary to dilate the stricture to the caliber of a No. 7 or No. 9 English scale before the instrument can be used. Third; that internal urethrotomy from without inwards is, under favorable circumstances, uncertain. Even with Mr. Teeran's tunnelled urethrotome (which I consider least objectionable), mistakes are liable to occur, *vide* his article in the American reprint of the *London Lancet* for 1874, page 210, wherein he states that one of Dr. Gouley's whalebone guides "was cut in two about its centre, six inches of the whalebone being left behind in the stricture. As the patient experienced no pain from its presence, I determined to leave it in the urethra, in the hope that it would set up a profuse discharge, and so facilitate the treatment. In this expectation I was, however, disappointed, and on December 1, I removed the broken portion of the bougie after its seven days' imprisonment."

One of the gravest and most obstinate of my cases was that of a gentleman who, under the care of another practitioner (one whom Sir Henry Thompson characterizes as a "knowing man at anatomy"), had been subjected to a forced entrance into the bladder. Pyæmia followed as a result of this violence, with the formation of five abscesses; one at the posterior border of the right scapula, and from which was evacuated at least one gill of pus; one beneath the left tensor vagina femoris; one beneath the right vastus internus, and which I believe reached the popliteal space; and one upon each internal malleolus.

The life of this patient trembled in the balance for weeks, but he finally made a thorough and complete recovery. His stricture was subsequently relieved by the multiple wedge. My friend Dr. H. F. Campbell, who saw this case in consultation with me, said that it was the only case of pyæmia which he had ever known to recover. I concur in the axiom first enunciated by Professor Syme, that "whenever urine passes outwards through a stricture, an instrument ought with care and perseverance to be got in." Also in the dictum of Sir Henry Thompson: "first and foremost, *dilatation—dilatation always—dilatation without exception whenever* it will succeed." (Italics mine). In corroboration of my position, I beg leave to make the following quotations:

Dr. Frank H. Hamilton, in his "Principles and Practice of Surgery," says of organic stricture: "To the question so often repeated by inexperienced surgeons—What proportion of organic strictures can be successfully treated by gradual dilatation? we answer unhesitatingly, almost every stricture into which the smallest sound or bougie can be introduced. And to the question which naturally follows, are there any strictures, through which urine can pass, which cannot be entered by instruments, we reply, that we have seldom or never met with them, and that such examples must, at least, be exceedingly rare. It is not pretended that all strictures of this class can be entered at once; but only with patience, perseverance, and skill, within a few weeks, or months at most, they will in all probability yield to the instruments, and the bladder will be safely entered.

"It is an error to suppose that a stricture treated by caustic or incision is cured any more thoroughly than when it has been treated by dilatation, or, as it might be more properly called, by absorption. There is no soundness in the theory upon which the claim is attempted to be sustained; and there is no experience to justify the assumption. We have observed the results of all these forcible methods in many cases; and there is the same tendency in all of them to a return of the stricture, unless the dilatation is afterwards maintained by the occasional and regular introduction of instruments. The only objection that can be offered to gradual dilatation, then, is the length of time it may require to complete the cure, as contrasted with forcible dilatation, caustic, incision and perineal section; but, on the other hand, it cannot be denied that, in point of safety, gradual dilatation has greatly the advantage. Death is seldom or never the result of the latter procedure; but from all that we have seen and heard of the other methods, they are followed by a mortality equal to five or seven per cent. Nor does it seem to vary much whether caustic, internal incision, forcible dilatation, or perineal section have been employed. Indeed, some gentlemen of large experience, who favor frequent incisions, admit a mortality of not less than seven per cent., and regard it as a flattering testimony to the excellency of their practice, because in very many surgical operations which are deemed justifiable the mortality is twenty-five or fifty per cent. The fallacy of the argument is too apparent to require exposure. If one is convinced, however, that the condition of the patient demands speedy

relief, or if it should happen that the stricture will not yield to gradual dilatation, the surgeon may resort to some one of the other methods already named, and which we shall now proceed to describe."

Dr. Otis, in his paper on stricture of the male urethra, its radical cure, 1875, closes with the following paragraph: "Strictures of a caliber of less than 16 or 18 of the French scale (7 or 9 of the English), and hence *below the capacity of the dilating urethrotome* as at present constructed, require enlargement by *gradual* dilatation with soft bougies, when this is well borne; if not, by divulsion or the urethrotome of M. Maisonneuve.

After having been brought by any one of these methods above referred to, *up to a capacity permitting the passage of the dilating urethrotome*, complete divulsion of the stricture by means of this instrument may readily be effected." (Italics mine.)

In Dr. Sands' reply to Dr. Otis, on spasmodic stricture of the urethra, he says: "I have seen, in consultation, persons who have suffered from troublesome hæmorrhage, varying in duration from a few days to a month, in consequence of having been cut with the dilating urethrotome—an excellent instrument of its kind, but the use of which has been carried to a dangerous excess. Finally, I have heard of a number of cases in which death has resulted from the employment of the dilating urethrotome. It is hard to obtain access to these fatal cases, which are not usually reported, and which are generally considered a kind of private property. I can state with authority, however, that three fatal cases of operation with the dilating urethrotome have lately happened in our city hospitals, two of which occurred last week in one hospital.

"In two of the cases mentioned, death took place from pyæmia within a week of the operation. In the third case, death occurred from uræmia on the sixteenth day after the operation, which was performed for the division of an anterior stricture so slight as to be detectable only with a bulbous sound, No. 24 French. At the autopsy three deep incisions were found, involving the anterior 3½ inches of the floor of the urethra, the mucous membrane of which, in this situation, was not thickened, and showed no appearance of disease to the eye.

"A tight organic stricture, undivided, was noticeable at the bulbo-membranous junction. This, during life, had been treated by dilatation."

In the American reprint of the London *Lancet*, for 1874, page 404, Mr. Teeran, in his "Description of a Catheter Urethrotome with Conducting Bougie," says: "Then again, most of the urethrotomes are so large at their vesical extremity that they cannot be used, unless the urethra has been previously dilated up to a certain caliber. This remark especially applies to those urethrotomes that divide from behind forwards. For a urethrotome, to be a safe and efficient instrument for the division of tight strictures in the deeper portions of the urethra, it must possess two important qualities: Firstly, its vesical extremity must be so fine that it can be introduced through very tight strictures. It consequently follows that the urethrotome must be one which divides from before backwards, for, *if the stricture be capacious enough to permit an instrument to pass which cuts from behind forwards, the indication for any operation is doubtful; for, if we have dilated the urethra up to half its natural caliber, why should we not persevere with the treatment which has been so successful, and that, too, in the worst and most troublesome stage of the complaint?* (Italics mine.) What we want is to save time in certain cases, where patients have, for instance, to go to sea suddenly, and where time does not permit of a course of treatment by gradual dilatation."

In the abstract of Guy's Hospital reports in the *American Journal of the Medical Sciences*, for January, 1879, page 178, the following views are quoted from Mr. Cooper Forster: "He has done external urethrotomy only once in the last seven years, and then regretted it afterwards, and he has never performed internal urethrotomy.

"He relies on the hot bath, opium, and gradual dilatation."

M. Despres, in a communication to the Societé de Chirurgie, October 16, 1878, on the extraction of prostatic calculus, "did not wish to perform urethrotomy, as he considers this an operation which *renders stricture more fibrous and resisting*." (Italics mine.)

In the American reprint of the London *Lancet*, for February, 1879, page 71, I find the following emphatic language from Mr. Messenger Bradley upon the subject of internal urethrotomy:

"In boldly criticising it, then, as dangerous and unsatisfactory, I would have you remember that it is criticism of one who has never performed it, and who, I think I may add, never will."

Sir Henry Thompson, in his "Clinical Lectures on Diseases of the Urinary Organs," and, than whom, upon this subject, there is no higher authority, fully sustains me in the position I have assumed. *Vide* page 32 of the above mentioned monograph:

"I will touch lightly on the continuous dilation or the tying in of the instrument. There is a patient up-stairs who is now undergoing it successfully. You have tried, we will suppose, the simple dilatation, and have not made the amount of progress desired, or perhaps the patient's avocations may make it necessary to have a more speedy cure. In either case you may say, if you can give me ten or fourteen days in your room, not necessarily in bed, but on the sofa quietly at home, I can almost certainly bring you from the smallest number up to the highest—that is, by continuous dilatation." As to the length of time required, Sir Henry claims greater potency for the continuous method than I have, as yet, been able to obtain. "In simple dilatation the instrument is simply introduced and withdrawn; in continuous, you tie the instrument in, and allow it to remain for several days. You tie in a small catheter, which, if possible, is to be gum elastic, and so that it just enters the bladder. And you should always take care that it is small enough to pass easily, so that it lies loosely in the canal. Those three conditions being granted, *this is one of the safest and best modes of treating stricture*." (Italics mine.)

In response to a note of inquiry, my friend, Dr. Eugene Foster, member of the American Public Health Association, and President of the Georgia State Medical Association, kindly furnishes me with the following communication:

AUGUSTA, GA., Nov. 23, 1883.

DEAR DOCTOR:—In reply to your letter of the 22nd, asking my experience in treating strictures of the urethra by your multiple wedge principle, I beg to submit the following answer: I have treated sixteen cases of close organic stricture by your method (several of them of years' standing), and every one of them successful. Your plan of treatment has, in my hands, proven itself all that you claim for it. I am amazed that surgeons generally have not tested its merits, and long since given you credit for your valuable suggestions.

Very truly yours,

(Signed) EUGENE FOSTER.

To Dr. Jno. S. Coleman.

CONCLUSIONS.

In the foregoing paper the following are the principal precepts that have been advocated.

First: That in the treatment of organic strictures of the uretha, urethrotomy whether internal or external, and also the method by divulsion, are attended with serious risk to the patient on account of hæmorrhage, pyæmia and uremia.

Second: That strictures treated by these methods are no less liable to recurrence than those treated by gradual dilatation. Indeed, unless followed by persistent dilatation they are subject to early relapse.

Third: That gradual dilatation of urethral strictures, though of slower progress in the beginning, is almost entirely free from danger, more permanent in its results, and upon the whole the shortest and most perfect method of cure.

Fourth: That in the treatment of tight urethral strictures the *Multiple Wedge Principle* devised by the writer, viz.: That of introducing side by side and one at a time successively a number of filiform bougies, whether applied to the interrupted, or the continuous method, offers to the surgeon the easiest, safest and best method for effecting the solution, or *absorption* of the inodular tissue, and for removing the obstruction.

NOTE.

In the discussion of the above paper, as reported by the *Medical Record* of New York, "Dr. Sayre thought it somewhat strange that the author of this paper claimed to be the originator of the Multiple Wedge System, since, to his personal knowledge, this system had been in use in Bellevue Hospital, New York, for at least twenty years."—To me, it is passing strange that my friend, Prof. J. W. S. Gouley, a member of the staff of Bellevue, and, the author of one of the best monographs on "Diseases of the Urinary Organs," should not have appreciated a system which, according to Dr. Sayre, had then been in use *in the hospital* for eleven years. That he did not do so is manifest from the following language in his letter to me of date Dec. 9th, 1874: "I have myself wedged in two and sometimes three of these bougies side by side, and have thus rendered otherwise impassible strictures amenable to ordinary dilatation. Three years ago, I had some probe-pointed whalebone bougies made very small (capillary) for the first two inches from the vesical end and thence increasing gradually to Nos. ½, 1, 2, 3 and 4, *so that I could accomplish more dilatation with a single bougie at one sitting than I could with two or three ordinary whalebone capillary bougies introduced side by side.*" (Italics mine.) I claim to have made the Multiple Wedge Principle a system for the treatment of tight, close, otherwise impassible strictures; to have given it a name, and, to have been the first to make it known to the profession.

Whewell says: "Names record discoveries."

SPECIFIC TREATMENT OF DIPHTHERIA AND CROUP.

BY GEO. A. LYNN, M.D., MONONGAHELA CITY, PA.

Read to Section on Practice of Medicine and Materia Medica of American Medical Association, May, 1884.

The efforts of many earnest workers in the medical profession, have of late years been directed toward investigating and seeking to isolate the causes of disease. And the tendency is to ascribe the cause of a class of diseases to the presence in the human body of a contagium, spore, or morbific germ, producing zymosis, with more or less intense disturbance of general nutrition, with or without local lesion of the solids.

As yet none of these have been satisfactorily determined. And while this work is necessary to the advancement of medical science, yet it would be of little avail to the human family to isolate, classify, and describe a morbific element, so long as we have no antidote for it, or means of protecting the human body from its ravages.

Prof. William Pepper, in his address on medicine, delivered before this association at Richmond in 1881, said: "It is clear that if we possessed a perfect antidote for the poison of a zymotic disease, our medicinal treatment would resolve itself into the administration of that antidote in suitable doses and forms, with due regard to the state of the digestive organs.

It seems yet presumptuous to hope that we shall ever possess such antidotes for the acute infectious diseases as we have for syphilis and malaria. But I cannot omit a passing reference to the remarkable results that have recently been observed to follow the use of large doses of bichloride of mercury in diphtheria."

After stating that the subject was brought to his notice, by a paper I read before the Washington County Medical Society, and published in the Transactions of the State Medical Society of Pennsylvania for the year 1879,—he gave a notable example of the efficacy of the treatment in a desperate case of diphtheria under his own observation, in which the result was highly satisfactory. And added, "The

extraordinary tolerance of such large doses of bichloride of mercury, and the rapid and progressive improvement from so desperate a state, makes me regard this as one of the most remarkable cases I have ever witnessed."

The object of this paper is to show the proper method of using the bichloride of mercury as a specific in the treatment of diphtheria. The mere use of a remedy does not necessarily constitute its use as a specific. For instance if one should attempt to control a malarial fever with ¼ grain doses of sulph. of quinia given two or three times a day it would most signally fail, and he might say that he had tried the remedy and it had failed in his hands.

So in using the bichloride of mercury as a specific in diphtheria, the dose, time of giving, and stage of the disease, are as important as the remedy itself.

Without entering into a discussion of the pathology of the disease, I may point out what seems to have escaped the notice of most writers on diphtheria, that there are two distinct stages in the disease; one the disease proper which lasts from three to five days, and terminates in the full development of the membrane and the generation in it of a deadly poison, the other, the effects of the absorption of this poison, which is generated in the membrane ONLY, and not in the blood, but when absorbed in sufficient quantity destroys the red corpuscles of the blood. Patients do not die in the first stage of the disease (except in the croupous form) but only from the effects of the poison absorbed from the membrane.

Taking this view of the case to use the bichloride as a specific:

1st. It must be given in the first stage of the disease.

2d. It must be given in large doses, frequently repeated.

The effect of large doses of this remedy, given in the early stage of the disease, is to reduce the temperature, relieve pain in the head, back, and limbs, unlock the secretions, lessen the soreness in the throat, in time, to relieve the nausea and vomiting, restore the appetite; and most of all, it prevents the generation of the poison in the membrane; in mild cases it checks the formation of membrane at once, and causes what is formed to speedily disappear.

Now, as I claim that the greatest virtue of this medicine consists in its preventing the generation of the poison in the membrane, the absolute necessity of giving it early in the disease becomes evident.

It will take physicians a long time to find out the value of this remedy, if they persist in only trying it after everything else has failed, and their patient is in a moribund condition; yet even in such cases, I have known it to prove successful. Prof. Pepper's case, quoted above, if not utterly hopeless, was at least one that very rarely recovers under ordinary treatment.

In using a medicine of so great power, the manner of exhibiting is of some importance. It is best given in solution, so that when excessive nausea is present, the dose may be gradually lessened and the time shortened, giving the stomach a chance to dispose of it, and at the same time keeping up full treatment. By ordering the druggist to make a solution of the bichloride in alcohol of the strength of gr. j to f. ℥j, and dispensing from this, the weighing of a grain and fractional parts of a grain is avoided. Next in importance is a pleasant vehicle in which to give it; this we have in elix. bismuth and pepsin, or elix. of pepsin. Pepsin itself has a good influence in the disease, and is said to have the property of softening the membrane.

In a mild case of diphtheria, I give a child 3 years old $\frac{1}{16}$ of a grain, or in a malignant case $\frac{1}{12}$ of a grain of bichloride of mercury in a teaspoonful of elix. of bismuth and pepsin every 3 hours. To an adult I give from $\frac{1}{12}$ to $\frac{1}{8}$ of a grain every 3 hours.

The manner in which this dose is borne in a bad case of diphtheria is a matter of surprise to a physician using it for the first time. It rarely disturbs the stomach, and soon allays existing nausea. I have never seen it produce ptyalism, and it seldom acts on the bowels more than is desirable. I generally order carbonate of magnesia to be given the first night, and after that the action of the bichloride keeps the bowels open. Under this treatment, when commenced early, in an ordinary case the patient will be convalescent by the end of the third day, but in more grave cases, the medicine should be continued to the end of the fifth day—it rarely needs to be given longer.

Thus far, I have been speaking of cases where the treatment has been commenced at the very first appearance of the disease; no tonic or sustaining treatment is needed, and the results are uniformly good; but where the disease has made considerable advancement, and the poison of the membrane is already being absorbed, as may be the case, before the physician is called, the result may not be so satisfactory, and brandy and iron should be added to the treatment.

If we assume that this treatment is no better in results than the general method in vogue, still it has many advantages that strongly recommend it.

There is but one medicine to be given, and there need be no confusion or mistakes. No washes or gargles are needed; no swabs or probangs to be thrust down the throat to strangle and frighten the patient, and make him wish he was dead and at peace; no steaming; no atomizing; none of these—only a teaspoonful of not unpleasant medicine and two or three hours' rest. While I hold that the corrosive chloride of mercury, given in large doses in the very early stages of diphtheria, is a specific, because, when so used, it prevents the generation of the poison in the membrane, and soon arrests its formation, yet membrane is often formed before we are called to the case, or before the remedy has had time to stop the process; and in this case, it may involve the windpipe, or may be primarily formed there, causing diphtheritic croup; and a new danger arises from mechanical obstruction, for which the corrosive chloride gives no relief.

The difficulty of breathing is common to all kinds of croup. It is as great for the time being in simple croup as it is in pseudo-membranous or diphtheritic croup. For this and other reasons it is held by good

authority that the dyspnœa of croup is not due in the main or even in great degree to the mechanical obstruction of membrane in the windpipe, but is rather due to the spasmodic condition of the glottis, and of nervous origin. It is for the relief of this dyspnœa that we resort to tracheotomy, at all times a dangerous operation, and in diphtheritic croup almost hopeless. In any kind of croup the operation, if successful, only enables the patient to breathe. Its effect on the disease is rather to aggravate than otherwise. If we had a remedy that would control and relieve the spasmodic condition of the glottis in croup we would have little need for this operation. And I think we have this in the chloride of gold. A few years ago I was using the chloride of gold, as recommended by Niemeyer in his practice, in some obstinate cases of hysteria, and observed that it had marked effect in nervous affections of the air passages, and was thus led to try it in a bad case of diphtheritic croup, of which I will give a brief history.

In the afternoon I was called to see a child five years of age suffering from a severe attack of diphtheria in advanced stage, it then being the third day of its sickness. Pulse 120, quick, small; temperature 104; respiration 40; tonsils covered with heavy membrane; glands of the neck swollen; tongue heavy furred; breath fetid; nausea and vomiting. From the breathing of the child I apprehended invasion of the larynx.

I ordered one-twelfth of a grain of corrosive chloride of mercury in a teaspoonful of elix. bismuth and pepsin every three hours, with instructions if the child grew worse to send for me.

About 3 o'clock in the morning I was called up, with the information that the child was much worse, and had croup. If this statement was true it made the case nearly hopeless, and I determined to try the effect of the chloride of gold.

Taking with me a solution of the strength of a grain to an ounce of water, I went to see the patient. As reported I found the child much worse,—almost asphyxiated from croup,—lips livid,—cheeks flushed,—dusky red,—and unable to articulate. I ordered twenty drops of the solution of the chloride of gold,—dropped in a glass with a little water,—and given every hour till some relief was obtained. The bichloride of mercury to be continued. In the morning I was agreeably surprised to find the patient very much better,—breathing easy but still having croupous cough. Continued the chloride of gold in the same dose every three hours. The next day the child was still better, asking for food, and quite relieved of croup. The chloride of gold was then withdrawn, continuing the bichloride of mercury.

From this on, the child improved steadily and in three or four days was convalescent.

Since then I have used the chloride of gold in all cases of croup. In simple croup it acts as a specific, and nothing else is needed, and but few doses of this.

The chloride of gold should be given in solution in distilled water. As it is very deliquescent and difficult to weigh, I direct the druggist to dissolve the contents of a 15 grain bottle,—as it comes from the manufacturer,—in 15 drachms of distilled water, and dispense from this solution.

A caution is necessary in administering,—not to use a spoon,—on account of the strong affinity the preparation has for metals, especially for silver. I direct it dropped in a glass with a little water, and as it is almost tasteless there is no difficulty in taking it. The dose may be from $\frac{1}{50}$ to $\frac{1}{20}$ of a grain every one to three hours.

MEDICAL PROGRESS.

MATERIA MEDICA AND THERAPEUTICS.

ON THE ACTION OF DIGITALINE.—M. Kaufmann has been conducting a series of experiments with this drug in the laboratory of M. Chauveau, the results of which he gives in the *Revue de Medicine* as follows: (He used principally the larger animals, viz.: dog, sheep, ass and horse, for his subjects.)

1. In animals that are in good health, digitaline does not produce diuresis, either when given in large or in small doses.

2. Used hypodermically or administered in powder by the stomach, it produces a diminution in the quantity of urine, and an increase in the quantity of urea.

3. Administered by the stomach in a liquid form and weak dose, it diminishes the secretion of urine and of urea.

4. It does not produce diuresis except in certain dropsies due to affections of the circulation.

GENERAL CONCLUSIONS.

1. Digitaline acts as an energetic local irritant.

2. The general effects are best shown when the solutions are passed into the veins, the trachea or the stomach.

3. The subcutaneous and intra-muscular injections produce a reactive fever.

4. Digitaline produces a slowing of the pulse with a small dose, a slowing followed by an acceleration with a moderate dose, and an acceleration with a strong dose.

5. The inhibition of the heart is due to a bulbar and intra-cardiac excitation of the moderating system, and the acceleration is due to a central and peripheric paralysis of the same system.

6. It raises the intra-cardiac diastolic and systolic pressure, and consequently increases the mechanical work of the heart.

7. It increases the energy of the cardiac contractions and increases the volume of the waves.

8. During the inhibition the cardiac contractions are often associated by twos or threes.

9. During the acceleration the heart beats are regular.

10. In a weak dose, the pulse becomes stronger. In a strong dose, it is strong at first and then becomes weaker.

11. The pulse often takes on the dicrotic or tricrotic form.

12. Weak doses increase slightly the arterial tension by central peripheric excitation of the vasomotors; stronger doses increase it at first, and then diminish it.

13. It diminishes the rapidity of the blood flow in the arteries.

14. It lowers the temperature of the rectum.

15. It diminishes the quantity of urine secreted by healthy animals.

THE TREATMENT OF THE VERTIGO OF MENIERES DISEASE BY LARGE DOSES OF SULPHATE OF QUINIA.—M. Charcot at a recent clinic at *la Salpetrière* (*Gazette des Hopitaux*), presented two cases of this vertigo, with the characteristic shrill sounds, intense hissings in the ears, followed by the sensations of movement in various directions.

The first patient presented these symptoms to a very marked degree on entering the hospital; he had been under the treatment since that time, for a space of three and a half months. First the vertiginous symptoms disappeared, until now there only remains the staggering on walking, or the cerebellar vertigo, which is much more difficult to overcome than the cerebral vertigo. He was treated as follows: For twenty days he was given daily twelve (12) grains of sulphate of Quinia. Then a suspension for ten days. For twenty-seven days the same dose, followed by a suspension of eight days. For twenty-two days the same dose, suspension for nine days. For nineteen days to date of observation the same dose.

The second case was completely relieved. This patient was a woman who was obliged to keep her bed for seven or eight years on account of the severity of these symptoms. She has been for a number of years under this same course of treatment. In 1875 she already showed marked signs of improvement—no longer having habitual vertigo, nor excerbations, nor disordered movements, nor those sensations of falling which kept her to her bed for so long a period, but at that time she still walked with difficulty, with hesitation and staggering like a drunken person—or like one having been deprived of the use of their legs for a number of years. Now she presents the appearance of one completely cured, walking without the slightest hesitation, and with a firm step. Her health is perfect.

ON THE USE OF CHROMIC ACID FOR CAUTERISATION IN DISEASES OF THE NOSE, PHARYNX AND LARYNX.—Dr. M. Hering has an article on this subject in the *Revue Mensuelle de Laryngologie, d' Otologie et de Rhinologie*, in which he considers:

1. That chromic acid, placed upon metal sounds, is an energetic caustic, but little painful, irritating the mucous membranes but slightly, and used to the best advantage in adenoid tumors, granulations, soft polypi, parenchymatous hyperplasias, etc.

2. A too energetic cauterisation over too extended a surface, may produce either by the absorption of the caustic, or by its introduction into the stomach through the pharynx, symtoms of intoxication, vomiting, etc., accidents which may be prevented by the use of the salts of soda in the solutions. Hering has never seen any dangerous collapse, or choleraic intestinal catarrh follow these conditions.

3. Infinitesimal quantities are sufficient for cauterisation, an operation which must be performed with care; the surplus of the acid being neutralized, and the cauterisation not repeated until the inflammation has disappeared, and the eschars have dropped off.

4. Chromic acid produces a better effect than any other of the medicaments used at the present day in the treatment of chronic catarrh, with tumefaction and moderate hypertrophy of the turbinated bones; and its best quality is that it produces a rapid cure without causing great pain.

OBSTETRICS AND GYNÆCOLOGY.

PUERPERAL GLOSSITIS.—M. E. Blanc, in *L' Union Medicale*, gives the case of a primipara, 21 years of age, as an example of glossitis evidently associated with pregnancy and the puerperal condition.

The inflammation of the tongue set in at the fifth month of pregnancy. The woman noticed, she said, thick skin forming on the dorsal surface of her tongue, which fell off in a few days, leaving the mucous membrane bare, which soon cracked. Mastication was very painful. Soon new masses of epithelium reformed to disappear in their turn. This same series of phenomena was frequently reproduced, in spite of a variety of topical applications the characters of which were not familiar to the patient. Ptyalism was moderate and there had been no gingivitis.

During the last month of pregnancy this glossitis disappeared spontaneously, to reappear at the time of labor. Blanc saw the tongue covered with a pultaceous coating, which was thick and white, and which disappeared in two days. Then the mucous membrane became red, glazed as if varnished in the centre, and white on the edges, except at the red points formed by the prominent papillæ. For two days the tongue was completely denuded. Finally the epidermis reformed, and the mucous membrane again became normal about the ninth day.

This condition of the tongue suggested scarlatina, but the patient examined with great care, never had the angina or eruption, and the temperature had always been normal. Moreover, at no time was there any albumen in the urine. It was impossible to find any other cause for the glossitis than pregnancy and the puerperal state, which so often provokes in other cases gingivitis and ptyalism.—*Le Medecin Practicien.*

MEDICINE.

ON THE ATONIC DILATATION OF THE STOMACH.—Prof. Germain Sée and Dr. Albert Mathieu have published in the *Revue de Medecine* the first part of an interesting paper on this subject, with the following résumé:

1. Besides those dilatations of the stomach which are due to a relative or absolute obliteration of the

pylorus, there are others in whom this mechanical cause cannot be considered.

2. In a certain number of these cases, lesions appreciable by the microscope, give a sufficient cause for the exaggerated distension of the organ. (Interstitial cirrhosis of alcoholics, fatty degeneration, etc.)

3. The dilatation of the stomach is produced in a passive manner among feeble individuals, exhausted by a general cachectic condition, in consequence of this weakness, and perhaps, particularly from a want of action of the muscular walls of the abdomen.

4. In the other conditions, there is simply a paralysis of the stomach, which numerous observations assign as the consequence of a general traumatism or an epigastric traumatism.

5. Most frequently simple dilatation of the stomach occurs in individuals who present particularly a condition of general neurosis.

6. It occurs in the course of crises which seem to indicate a successive and alternate intervention of a special state of spasm and atony of the gastro-intestinal motor system.

7. These crises, often painful, sometimes accompanied by diarrhœa, are habitually provoked by an occasional or general cause, such as the emotions, moral shocks; or by a local cause such as excess in, insufficiency or bad quality of food. These crises are in this way the local manifestation of a constitutional spasmatonic neurosis (the neurasthenia of certain authors).

8. Constipation and flatulence seem to play an important part in the mechanism of the development of these gastro-intestinal disturbances with a predominant gastric dilatation.

9. Dyspepsia rarely occurs previous to the dilatation but frequently succeeds it. It seems to be characterized by the presence in marked quantity of peptones in the urine.

10. In all cases permanent gastric dilatation does not occur until after alternations of spasmodic action (the cause of the pain and diarrhœa) and of atony (the cause of distension).

THE PATHOLOGY OF THE CERVICAL SYMPATHETIC.—Möbius has given considerable space to this subject in succeeding numbers of the *Berliner Klinische Wochenschrift*, of which an excellent analysis is given by Dr. Francotte, in the *Annales de la Société Médico Chirurgicale de Liège* as follows:

The cervical sympathetic has been the object of numerous experiments of which the principal results are the following:

1. Section of the sympathetic produces dilatation of the vessels in many regions of the head; excitation determines their constriction.

2. Irritation of the sympathetic produces transpiration in different parts of the head.

3. Section of the sympathetic produces a contraction of the palpebral opening and of the pupil, with retraction of the ocular globe; irritation gives the opposite effect.

4. On irritating the cervical sympathetic, there follows a secretion from the parotid and sub-maxillary glands; the saliva is thick and consistent.

5. Irritation of the sympathetic produces cardiac acceleration.

In the healthy man conditions of excitation or paralysis of the cervical sympathetic have often been observed. In the state of excitation there is always, naturally, a connection with the reflex processes, which may have their point of departure at the cerebral cortex. Under the influence of intense emotions, such as fear, the face pales, the brow is covered with sweat, the eyes start out of their sockets, the palpebral openings and the pupils dilate. Passions that are not so strong, as shame and anger, act principally upon the vaso-motor fibres. Painful irritations carry their action particularly to the ocular fibres, and are followed with dilatations of the pupil. The most important cause of the paralytic states of the cervical sympathetic is age. In the old person the pupil and the palpebral opening become contracted, the eyes are sunken and the pupil re-acts but feebly to sensible excitations.

All these phenomena have nothing to do with a direct irritation or a lesion of the cervical sympathetic. The application of a direct irritation, mechanical or electric, to the nerve has often been tried, but the results are open to criticism. It is a question as to whether the results were due to a direct irritation or to a reflex process from irritation of the skin. The interpretation of clinical symptoms is subject to the same error, phenomena may be attributed to a direct lesion of the sympathetic which are due to reflex action. The symptoms observed cannot be attributed to the sympathetic unless a limited alteration of the nerve is noted, or unless there is found in the living subject, a lesion which can act upon the nerve by its seat and nature.

To illustrate this, Möbius details a case which first came under his notice in May, 1882. A student had received a knife wound in the right cervical region, the instrument penetrating to the depth of 12 centimeters (4.7 inches). The wound healed without complications, the patient resumed his studies. He noticed that his right eye became easily fatigued and that it wept after he had read for a time; he noticed at the same time a disagreeable feeling in the right side of the face. On examination, a recent cicatrix was found on a level with the angle of the lower jaw, and extending for a length of three inches, parallel to the anterior border of the sterno-cleido-mastoid with an infiltration cylindrical in form. The right palpebral opening was narrower than the left, the right conjunctiva was slightly injected and more moist than the left. The situation of the eye-ball, its consistency and the appearance of the cornea seemed to be alike on both sides. The right pupil was half the size of the left. Both re-acted equally to light and accommodation. On using the faradic forceps the left pupil dilated a little, the right remained motionless. No notable difference in moisture on either side of the face, but the patient declared that he did not perspire in the neck, nor on the right side of the face, which seemed to be warmer to him. The temperature in the right external auditory meatus was 97.7°, in the left it was 96°. The right ear was redder than the left. The radial pulse was the same on

both sides, 66 per minute. The patient said that it had formerly been 74, and now he frequently felt palpitations, particularly in the afternoon, that were formerly unknown.

Treatment, massage and electrization was ineffectual, but the patient improved somewhat, the palpebral opening enlarged somewhat, the right eye was less easily fatigued, the palpitations diminished and disappeared.

July 18, 1882 (10 weeks about), palpebral opening a little larger, contraction of pupil, injection of conjunctiva, elevation of temperature in auditory canal, redness of ear and absence of perspiration persisted. Pulse, 72–74.

Jan. 15, 1883. Induration in neck almost gone. Right cheek markedly flatter than the left, right eye more sunken in the orbit, seems smaller to the touch, no difference in consistency between the two eyes. Palpebral opening and pupil contracted one-half. Right ear the warmest. Injection of conjunctiva disappeared. No difference to the patient between the temperature and perspiration of the two sides. Palpitations returned. Radial pulse the same on both sides, 88.

Jan. 9, 1884. Right cheek flatter than left, right ear warmer and redder, right eye more sunken, pupil and palpebral opening contracted. Re-action of pupils to light, more sluggish in right, re-action of convergence equal in the two sides, on cutaneous irritation the left pupil dilates a little. Eserine produces a very slight contraction of the right pupil, atropine produces a much greater dilatation in the right than in the left pupil. No atrophy of the tongue, but it is very tremulous. The right side of the neck is very sensible to pressure, the left is much less so. Pressure over the vertebral column at the third and fourth cervical, and fifth and sixth dorsal, as well as in the epigastric region, is painful.

The two hands tremble, particularly the right. The right arm possesses all its motility and its sensibility, it gives a record of 61 with the dynamometer, while the left gives 91. Heart normal, but the patient complains of palpitation. His memory is enfeebled, he is timid and impressionable.

Now for the grouping and utilizing of these symptoms:

1. Contraction of the pupil on the side of the lesion. Never very marked. Re-action to light sluggish, to convergence normal. Reflex dilatation absent.

2. Narrowing of the palpebral opening. This is very marked, and due to paralysis of Müller's muscle.

3. Retraction of the eye-ball. This symptom is less frequently noted than the two preceding, it is only developed later in the course of the affection, and depends, according to Nicati, upon (a) the shrinking of the eye-ball; (b) the atrophy of the fat of the orbit; (c) the paralysis of the muscle of Müller. Besides there is sometimes a softening of the tissues of the eye-ball itself dependent upon deficient nutrition.

4. Vascular symptoms in the head. These are often wanting, but they may escape attention and only manifest themselves under the influence of cold, of heat, and of the emotions. Most frequently, redness, elevation of temperature and hyperidrosis are observed. But again there may be pallor, coldness, anidrosis, and atrophy of the face. Nicati supposes that these contrary groups of symptoms may correspond to two different phases of the affection.

5. Increase in perspiration. This is attributed to a dilatation of the vessels, but this is contradicted by cases where the part being warmer and redder than healthy portions, does not perspire to a greater extent.

6. Emaciation of the affected part. This is independent of the vascular disturbance, and in this case did not come on for nine months.

7. Modification of the heart's action. This case gives the first record of such a symptom, it causing a slowing of the pulse.

8. Modifications of the salivary secretion. This has never been noted in man. Nor was there any alteration of the thyroid gland. The cerebral symptoms are of doubtful significance. All the nervous symtoms in this case (impressionability, trembling, hyperæsthesia, etc.) are considered by Möbius as reflex, a general neurosis from traumatism.

He considers this case then as an unilateral paralysis of the sympathetic. No cases of double paralysis, or of double irritation of the sympathetic are known. What we know of irritation of the sympathetic is from one case by Eulenburg, and three cases by Seeligmüller. The case of Eulenburg's (pressure on the sympathetic by a goitre) showed dilatation and immobility of the pupil, moderate exophthalmia and paresis of accommodation, coldness of half of the face, and acceleration of the heart's action. In Seeligmüller's cases (traumatic irritation of the sympathetic) there were three times dilatation of the pupil which remained sensitive, and which in two of the cases dilated more upon pressure or electrization of the sympathetic region; in one case dilatation, in two cases contraction, of the palpebral opening; in the one case protrusion of the eye-ball; in one case pallor and coldness of half the face, which in a few days was markedly flattened.

The etiology of affections of the sympathetic embraces most frequently a local cause, as compression by goitre, aneurism of the aorta, carcinoma and other tumors of the cervical and parotid glands, cicatrices, abscesses and various traumatisms. Seeligmüller considers that lesions at the apex of the lungs and the pleura may be communicated to the sympathetics; in fact phthisical patients often present such symptoms.

In concluding his article, Möbius considers migraine, Basedow's disease, facial hemiatrophy, angina pectoris, and progressive muscular atrophy; but does not admit in them any primitive lesion of the sympathetic.

ERRATUM.—The names of John Mills Browne and Albert Leary Gihon, were inadvertently omitted from the list of permanent members from the U. S. Navy and incorrectly included among those from the District of Columbia, pp. 713 and 717, Vol. II, No. 26, JOURNAL OF THE AM. MED. ASSOCIATION.

THE

Journal of the American Medical Association.

PUBLISHED WEEKLY.

THE EDITOR of this JOURNAL would be glad to receive any items of general interest in regard to local events, or matters that it is desirable to call to the attention of the profession. Letters written for publication or containing items of information, should be accompanied by the writer's full name and address, although not necessarily to be published. All communications in regard to editorial work should be addressed to the Editor.

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Address

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,
No. 65 RANDOLPH STREET,
CHICAGO, ILLINOIS

SATURDAY, JULY 26, 1884.

"OPIUM SMOKING AS A THERAPEUTIC MEANS."—There are two drugs comprised in our list of therapeutic agents which, however potent for good, are dangerous to human happiness by reason of the very properties which make them boons to mankind. These are opium and alcohol. Each is sure to bring mental, moral, and physical ruin upon its devotee. Each is capable of effecting as complete debasement as did the magic wand of Circe when it transformed Ulysses's companions into swine. The very insidiousness with which these drugs allure their victims increases their danger. Every practitioner of extended experience must be able to recall instances in which the physician's prescriptions proved the foundation of either one or the other fatal habit. We have in mind a young man of brilliant parts who attributed his incurable love of strong drink to the whisky and quinine ordered by the doctor as prophylaxis against malaria. Facts like this are too well authenticated to be denied, and even to mention them may savor of truisms. What then is to be said of the frequency with which the opium habit is contracted under similar circumstances? Often it is the only alternative to an existence rendered otherwise unbearable by excruciating pain. But does this consideration lessen the evils of the habit?

Whether the internal consumption of the narcotic be on the increase, as maintained by some, or not, there is one method of its use which has certainly assumed alarming proportions within a few years — we mean opium smoking. This vice of the East stares us in the face wherever the almond-eyed Chinaman has made himself a temporary citizen. Would that his vile habit might also depart with him! Our land is particularly open to this seductive vice because of the immigration of the Chinese. Hence, we feel it our duty to protest against the influence likely to be exerted by the article which appears in the *American Journal of the Medical Sciences* for July, 1884. It is entitled "Opium Smoking as a Therapeutic Means," and gives a resumé of the report which Dr. Thudicum made at the Twelfth German Medical Congress of his experience with the narcotic when smoked.

"According to Thudicum, opium smoking gives excellent results in a large number of affections. It rapidly cures a violent case of coryza, causing an almost immediate cessation of cough, and has a very calming effect in phthisical cough. In chronic coryza, also, two or three pipes smoked in the morning will soon bring about a complete cure; and in hay fever it is an excellent remedy. The author has also seen most excellent results in chronic neuralgia and migraine, which had stubbornly resisted large doses of quinine. Long-standing migraine may be cured in three or four months if the patient will persist in the treatment. Certain cases of hyperæsthesia, which sometimes lead to insanity, are also cured by this method.

"Of a large number of cases treated by Thudicum, only one has acquired the habit of opium smoking, so that the method by no means tends to produce the objectionable habit. A person may smoke for a long time and no inconveniences result other than a little digestive trouble. But, on the other hand, care must be taken that the patient smokes a sufficient quantity, as opium, in small doses, is a tonic and stimulant."

We quote the above in order that the reader may judge for himself if the spirit of the article be not calculated to do harm. What is the character of the diseases for which Thudicum recommends the measure? Acute and chronic coryza, phthisical cough, hay fever, chronic neuralgia and migraine, "certain cases of hyperæsthesia that lead to insanity." Are they not the very class of affections, excepting acute and chronic coryza, which, by their very stubbornness, predispose to the acquirement of such a habit? Moreover, it is expressly stated that the means must be often persevered in for several months in order to effect a cure. Finally, are these diseases so unyielding to other remedies as to make opium-smoking the *dernier ressort* and counterbalance the risks run?

Dr. Thudicum has been fortunate in having seen the opium habit confirmed in only one out of the large number of cases in which he has employed it. And it is to be hoped that he will continue to be as

fortunate. But we believe a more extended use of the measure would lead to a different opinion from that uttered by the article in the *Journal*, and that it would hardly endorse, as comparatively harmless, a means so seductively capable of mischief. We sincerely trust it will be long before our American therapeutists countenance this employment of opium. That the habit was formed in one case is proof that it is not devoid of danger, and serves to emphasize the necessity of practitioners of medicine exercising all possible caution in prescribing agents so capable of producing misery.

SIMPLE ABSORBENT COTTON VERSUS THE "ANTISEPTIC PAD AND DRESSING."—We have lately been informed by the *British Medical Journal*, June 14, 1884, of an antiseptic pad, manufactured by an American house in London. It is said to have the advantage over the ordinary sponge, in that it absorbs readily without having been previously wetted, and its absorbent power is said to be sixteen times its own weight. It consists of concentric layers of absorbent cotton and cocoa-nut fibre within a covering of gauze. An antiseptic substance is enclosed in a friable capsule in the centre.

Two names of prominent men are associated with this "pad," and yet we feel certain that the reflecting practitioner will consign such a device to the general category of "liver" and other "pads." What special advantage it can afford, except to the manufacturer, over the simple absorbent cotton, we certainly fail to see; and we refer to it only in order to extol the merits for various uses of the last-mentioned article. Absorbent cotton is already widely appreciated by all surgeons. It is constantly used by them, either in its simple form, or medicated as they require it. It can be taken from the packet which the manufacturers furnish us, and at a moment's notice made into a pad of any desired size. Under those circumstances it can be subjected to the physician's sense of touch, so as to realize its quality, whereas, if it is enclosed in a shut sack, any inferior material can be used.

Now, although the surgeon has learned to appreciate the value of absorbent cotton, we are disposed to think that its use is not sufficiently appreciated in the summer complaints of children, in the lying-in room, and certain affections associated with involuntary discharges. Should we be affected with the cholera epidemic now raging in Europe, a judicious use of absorbent cotton for the absorption of discharges may be of incalculable service; and by burning it when it has accomplished its purpose, we may do more towards confining the disease within reasonable limits than might at first seem possible.

EXCESSIVE MEDICATION.—In the JOURNAL for June 21, 1884, we alluded to the strong tendency recently manifested by members of the profession to give large doses, frequently repeated, of active medicines as germicides, prompted by the prevalent germ theories concerning the specific causes of disease. Allusion was made more directly to the use of mercurial preparations in the treatment of diphtheria. Our remarks elicited from Dr. Jno. S. Coleman, of Augusta, Ga., a brief letter stating that he had given to a little girl, aged three years, suffering from a severe attack of diphtheria, 84 doses of the bichloride of mercury, of one-eighth of a grain each, in nine days. The medicine produced neither purging nor ptyalism nor any other unpleasant effects; but the patient recovered and is now in good health. Another child in the same family had been attacked with malignant diphtheria a few days earlier, and died without having used the bichloride of mercury as a remedy.

It will be observed that Dr. Coleman's little patient took over ten grains of the corrosive chloride in nine days. But this does not equal in heroism the use of calomel by Dr. I. P. Klingensmith, of Blairsville, Pa., as detailed by him in a short article in the *Medical Record* of New York for July 12, 1884, p. 36. To a child 28 months old, attacked with severe diphtheria, he says: "I at once ordered 20 grains of calomel, which was followed by ten grains every hour until the third day, when, the membrane beginning to separate at the edges, the mercurial was discontinued. During the first three days of the treatment, a total of *seven hundred and twenty* grains of calomel were given." He relates two other cases, one a child aged three and one-half years, to whom he gave at once 20 grains of calomel, and 10 grains subsequently every hour for 15 hours, making 170 grains in less than 24 hours; and the other, a child aged four years, to whom he gave, in similar doses, 130 grains in 12 hours. All three of these children recovered. In commenting on the cases, Dr. K. says: "The calomel purges, but not to excess, causing simply free and copious evacuations of a greenish appearance." And, he adds, "I have never known ptyalism to occur in a single case."

In a paper read in the regular meeting of the New York Academy of Medicine, held April 24, and reported in the *Medical News* for July 19, Dr. A. Jacobi decidedly recommends the use of mercurials efficiently in the treatment of pseudo-membranous croup and diphtheria. He gives decided preference to the bi-

chloride and next to the oleate by inunction. But the largest doses he recommends for children from six months to three years old, are from one-fiftieth to one-twentieth of a grain in dilute solution, (1 part to 3000 of water), repeated every one or two hours during the stage of active exudation. And although these doses were generally borne without producing any bad effects, yet he mentions one case, a girl of six or seven years af age, in which three doses of one-twentieth of a grain each, produced griping and frequent bloody stools, making it necessary to reduce the dose to one-fiftieth of a grain. That some patients will tolerate very large doses of mercurials without any bad results, especially when laboring under diphtheria and some other acute general diseases, was demonstrated clinically half a century ago, when scruple, half drachm, and drachm doses of calomel were by no means rare. We have seen many patients who have taken such doses without apparent injury. It was also demonstrated that in most of such cases a large part of the calomel passed through the alimentary canal without absorption, as was probably the case with three-fourths of the 720 grains given by Dr. Klingensmith to his little patient. The bichloride given in dilute solution is much less likely to pass through the bowels without absorption ; and though much less likely to induce ptyalism, is more disposed to cause inflammation of the mucous membranes, than calomel.

Our best writers on medical jurisprudence and toxicology adduce cases, in which three grains of the bichloride taken at once, produced intense gastro-intestinal inflammation and death. And may it not readily happen that, the same remedy given in smaller doses, but repeated so frequently as to consume more than one grain per day for several days in succession, may accumulate until more than three grains are present in the system at one time? And should such a case happen to result disastrously to the patient, and the practitioner be arraigned for mal-practice, might he not find much difficulty in making a successful defense?

We do not allude to this subject for the purpose of criticising the case related by Dr. Coleman, or those of any other individual member of the profession, for when diphtheria appears in its more severe form, we have no doubt the early and efficient administration of the bichloride of mercury constitutes one of the most reliable means of combating the disease. We desire only to remind the present generation of practitioners that the rapid return to the use of large quantities of active medicines in the treatment of acute diseases under the stimulus of germ theories, is only repeating, under different names and theories, a practice abundantly tested half a century since. And should the present tendencies continue another decade, so far as mercurials are concerned, ptyalism in all its stages and destructive effects will again become as familiar to the profession and the community as it was to the preceding generations. Yet it must not be inferred that we altogether condemn the use of mercurials in medical practice. So far are we from this, that we have continued their cautious, and we trust judicious, use, in the treatment of a great variety of diseases, through all the changes of medical opinions and fashions of the last forty-five years. But we should dislike to see the extravagances of a past generation again become generally prevalent.

CHOLERA REPORT.—During the last week the epidemic has been steadily increasing in severity, in Marseilles and Toulon. For the twenty-four hours ending yesterday evening, July 20th, at 6 o'clock, the number of fatal cases in Toulon was forty-six, and in Marseilles during the same time, the deaths from cholera numbered fifty-seven, and this notwithstanding over sixty thousand of the citizens of Marseilles had fled from the city by railways and by overland routes as early as the 15th of the month.

Impending famine seems to threaten with added fatality, the panic-stricken people that remain.

Two cases are reported in Transylvania, and again we have the report of two fatal cases in Paris. It is the impression of those best able to judge, that the epidemic is destined to spread throughout Europe. It seems that the Paris Academy of Medicine declines to express to the government its views of the best methods of prevention, and of the treatment of cholera, since its advice as to the holding of the Fete of July 14th had been disregarded, and as regards quarantine measures. Portugal has extended her quarantine to all European shipping. Austria is moving to secure protection to herself as well. At Odessa two weeks quarantine has been established against all shipping from the Mediterranean.

The American Consul at London is instructed to announce that all vessels from Europe must have certified clean bills of health from the American Consuls at the ports from which they sail, or they will not be permitted to enter American ports.

On the 19th inst. President Arthur issued the following timely proclamation:

BY THE PRESIDENT—A PROCLAMATION.—Washington, D. C., July 19.—By the President of the United States of America, a proclamation:

While quarantine regulations are committed to the

several States, the General Government has reposed certain powers in the President, to be used at his discretion in preventing a threatened epidemic. Feeling it my duty, I hereby call upon all persons who, under existing systems in the several States, are intrusted with the execution of quarantine regulations, to be diligent and on the alert, in order to prevent the introduction of the pestilence, which, we all regret to learn, has made its appearance in some of the countries of Europe, between which and the ports of the United States intercourse is direct and frequent. I further advise that the cities and towns of the United States, whether on the coast or on the lines of intercommunication, by sound sanitary regulations and the promotion of cleanliness, be prepared to resist the power of disease and to mitigate its severity, and I further direct the Consuls of the United States in the ports where the pestilence has made or may make its appearance to exercise vigilance in the carrying out of the instructions heretofore given, and in communicating to the Government of the United States any information of value relating to the progress or treatment of the disease.

[SEAL] CHESTER A. ARTHUR.

By the President:

FREDERICK T. FRELINGHUYSEN,
Secretary of State.

It is hardly necessary to emphasize what we stated last week as to the necessity of thorough sanitation of the cities, thoroughfares and homes of our American people. What we wish now to urge, is, that especially in our great muncipalities, where thousands of inhabitants are densely congregated, the work of cleaning and of disinfecting shall *not be delayed.* If cholera comes, let its coming be without invitation. It is no time to renovate cities when the heat of summer is most intense, and to open the cesspools and sewers when the plague is upon us. Vigorous action by those vested with authority will do much to dispel fear, and calm apprehension, and so, in the most effectual manner yet known, disarm the plague of its terror. Let the needed work be done thoroughly and at once.

SOCIETY PROCEEDINGS.

SEWERAGE SYSTEMS AND THE EPURATION OF SEWAGE BY IRRIGATION AND AGRICULTURE.[1]

BY HENRY J. BARNES, M.D.

Many of the cities and towns of Massachusetts as well as those throughout the country have in the near future this question to dispose of in a scientific and practical manner. Political economy and the public health demand attention to this subject already in many communities. An epidemic of typhoid fever in a neighboring town would be a very dangerous menace to the health of the citizens of Boston in consequence of the water supply of the latter being the receptacle for the drainage and dejections of the former. A beautiful lake in the vicinity of Boston is made so filthy by a large sewer discharging into it that twice a public cry of reprobation has been raised against it. The valley of one of our large rivers has been rendered almost uninhabitable by the drainage of a large inland city. It is now said that the citizens of Chicago are much of the time drinking their own sewerage, as a result of taking water from a lake with which their sewerage system connects; and we may add that the city which is not troubled by its system of drainage is the exception and not the rule.

The effects of pollution by sewage of wells, springs, rivers, and ponds used for domestic purposes, are so generally recognized that no attempt is made to collate the many, many calamities which have befallen cities, towns, villages and families through ignorance or indifference as to what disposition is made of the refuse matter of dwellings, and we must also acknowledge that a comprehensive system of disposing of sewage must be inaugurated in the near future, both in towns and by every individual hamlet. The present method of gathering in cesspools or subterranean channels, which discharge in a manner to jeopardize health and comfort of ourselves and neighbors, must be abandoned for a system which shall dispose of and purify the sewage in a practical manner, or we must give up some of our large rivers for sewerage systems, or construct at enormous expense metropolitan systems, both of which have proved unsatisfactory, or failures in Europe.

London's metropolitan system, which discharges in the maritime Thames about twenty-one miles below the city, of which so much was expected, and cited as an example Boston might imitate, has proved far from what was anticipated. The sewage, instead of going to sea, or being diluted to an extent which would render it innoxious, is deposited by the tides above and below the mouth of the sewer in such a quantity as to cause a great cry of indignation from the inhabitants living along the banks of the river, and numerous petitions to parliament asking for relief have been presented.

Torquay and Brighton, draining directly into the sea, have experienced similar results, and their systems are pronounced failures. The once beautiful Bay of Naples is to-day a reeking pool of filth. A recitation of the many examples of pollution of rivers both in Europe and America, and the attendant evils, is unnecessary, but the following list of English cities where the courts have enjoined drainage into rivers, suggests what we may anticipate in this country: Bradbury, Blackburn, Chorley, Doncaster, Harrowgate, Leamington, Merthyr-Tydvil, Rugby, Tunbridge Wells, Warwick, Kendal, Birmingham, Bolton le Moor, Bradford, Coventry, Leeds, Halifax, and Rochdale.

[1] Read before the Section for Clinical Medicine, Pathology, and Hygiene of the Suffolk District Medical Society, April 30, 1884.

In 1870 the Royal Commissioners reporting on the pollution of the Mersey and the Ribble stated "that sewage discharged in running water is not materially changed for many hours by oxidation." This they demonstrated by the following experiment: A volume of filtered sewage from a drain in London was mixed with nine parts of pure water. Analysis of this mixture showed it to contain per 100,000 parts 267 parts of carbonaceous matter and .81 parts of nitrogenous matter. It was exposed each day to light and air, shaken and drawn by small siphons in a manner to cause a fall of over three feet from vessel to vessel. At the end of 96 hours there remained 25. parts of carbonaceous matter and .58 parts of nitrogenous matter, indicating a loss of but 17 parts of carbonaceous matter and .23 parts of nitrogenous matter. At the end of 192 hours it had lost but 25 per cent. of carbonaceous matter and 33⅓ per cent. of nitrogenous matter. This experiment was made in a temperature of 68° F., and was designed to show the change likely to take place in the current of a river running at the rate of one mile per hour, and carrying ten per cent. of sewage. They concluded that there was not a river in England long enough to dispose of a moderate amount of sewage through oxidation.

J. Babut du Mars says, "it has been proved that the waters of rivers do not lose a material amount of azote in a run of over three hundred miles. And the Prussian Government has consequently forbidden the pollution of rivers and seaports by the discharge of the detritus of cities."

The effects of imperfect sewerage systems are forcibly portrayed in a paper printed in the *Boston Medical and Surgical Journal* of February 22, and March 1, 1883. In that paper Dr. Morton Prince collates many epidemics of typhoid fever from this cause. He says, "it is estimated that in this State (Massachusetts) alone there are ten thousand cases of typhoid in each year," and every one knows that a large proportion may be fairly charged to defective drainage. How imperfect sewerage causes this disease was well illustrated at Nahant, Massachusetts, in 1881, and thoroughly reported by Mr. Ernest Bowditch. A paragraph from page 246 of the supplementary report of the State Board of Health 1882–83 would properly introduce the question discussed in this paper, as the successful epuration of sewerage by irrigation and agriculture depends upon where, and to what extent, nature provides in the soil for the elimination of filth. Mr. Bowditch says, after noting the improvement in the sanitary condition of the town the year following the epidemic, "while the conclusions as to soil recovery may be derived from insufficient premises, perhaps calling attention to the subject may lead to the discovery of facts warranting systematic research in this direction that may be of great sanitary value." Dr. Frankland wrote in May, 1881: "There are in nature powerful agents for the destruction of disease. It cannot be doubted: otherwise the human race would long ago have been exterminated. The problem is not entirely solved, but experience appears to demonstrate this action on sewage employed on irrigation, for when known to be infected by cholera and typhoid fever in England, it has never produced these diseases in the inhabitants living on the sewage farms and consuming the produce."

Many and varied are the systems advocated and methods adopted with the object of disposing of sewage. Surface drainage, cesspools, subterranean drainage, and the pneumatic system of Lienur are employed for collecting and discharging into rivers, ponds, bays, oceans, and on the land are the most common means of distribution. Filtration, precipitation, the employment of chemical agents, irrigation and agriculture are some of the measures adopted for the purpose of epuration.

CESSPOOLS.

Depositing sewage in cesspools is one of the most common as well as antiquated methods. The cesspools are emptied at intervals varying from one week to five or more years. They involve the concentration of fermentescible matter and the consequent generation of gases dangerous to health, beside the vitiation of subsoil water. The soluble organic matter contained in them is capable of very long journeys under ground, with the loss of coloring matter only, as many analyses have proved. Their use should not be tolerated, except the walls are made impervious to liquids, and they should be emptied at short intervals. A writer on the subject says: "The time is not far distant when they will be pronounced a relic of barbarism."

DOWNWARD INTERMITTENT FILTRATION PRACTICED AT KENDAL, ENGLAND.

The population is about 14,000. There are 450 water closets connected with the sewers, which discharge 868,000 gallons per day. A reservoir of deposit was first constructed, which overflowed on a farm of about fifteen acres, with the object of utilization by agriculture. The area of the farm proved insufficient to epurate the sewage completely, and five acres of filter beds were added. These, with the farm, suffice to purify the water. In 1875 the products of one-third of the farm, consisting of cabbages, beets, celery, and rhubarb, sold for $500. Oats and rye on another third $375, and on the remaining five acres $225 worth of hay was raised, making a total of $1,100 worth of produce from fifteen acres. The application of the sewage cost $550.

The operation of the same system constructed by I. Bailey Denton, at Abingdon, Great Malvern, and Halstead, England, and at Forfar, Scotland, has proved satisfactory, inasmuch as sufficient matter is eliminated to allow the effluent discharge into neighboring rivers, although it contains a large amount of putrescible matter, as indicated by analyses. It just escapes the ban of the Pollution Act.

THE PNEUMATIC SYSTEM OF LIENUR

is employed at Amsterdam for a limited number of the inhabitants. The sewer-pipes are made of iron, with air-tight joints. An air-pump makes a vacuum.

Closets are opened simultaneously once a day in section after section of the city; the content is drawn to the mouth of the sewer, from which it is carried away in barrels and deposited on the land. Its enormous cost bars its employment where any other system can be used.

UPWARD FILTRATION AT BIRMINGHAM, ENGLAND.

Population about 350,000 Eight thousand water-closets connected with the sewers, which discharged about 14,000,000 gallons per day in the river Tame. An injunction was obtained to prevent the discharge into the river, unless the sewage was first purified. A reservoir of deposit was built, and a system of upward filtration, but complaint of the continued pollution of the river necessitated its abandonment. The city then attempted irrigation and agriculture, but this was also enjoined. Finally, after much delay and litigation, the city bought 120 acres of land, and on the advice of an engineer constructed a new reservoir of deposit, where they treat the sewage with lime. To 13,434,860 gallons is added thirteen tons of lime each day. This clarifies the water to a certain extent by causing a deposit of about 300 tons per day, which is carted out and buried on the land.

It has been an easy matter to separate material in suspension from drain water by filtration, but as this represents only about one seventh part of the value of sewage for fertilizing purposes the process, though simple, has never proved renumerative, and chemists have been employed to suggest agents which would precipitate the soluble matter, which represents six sevenths of the value. Lime has been employed at Tottenham, Blackburn, and Leicester, but the Royal Commissioners report of each a failure, inasmuch as the drain water after being thus treated contains a large amount of putrescible matter.

TREATMENT OF LIME AND CHLORIDE OF IRON AT NORTHAMPTON, ENGLAND.

To 250,000 gallons of sewage is added about 100 quarts of lime and six quarts of chloride of iron, which are thoroughly mixed, and afterwards passed by upward filtration through a layer of calcinated iron eight inches thick. The waters come out without color or odor, and is then allowed to flow into the river. At first there was no complaint, notwithstanding the presence of a large amount of putrescible matter, but later the river became offensive, and the court has enjoined the discharge of such water in it.

THE A. B. C. METHOD OF SILLAR.

A mixture consisting of six hundred parts of alum, twenty-five parts of burned clay, one part of blood, ten parts of salt, nineteen hundred parts of clay, fifteen parts of animal charcoal, five parts of magnesia, twenty parts of wood charcoal, ten parts of manganate of potash, and two parts of calcined magnesia is added to the sewage to be treated in a proportion of about one pound of the mixture to 250 gallons, thoroughly agitated, and then allowed to settle in large reservoirs, which are alternately emptied, and the detritus taken out, dried, and sold as a valuable fertilizer. The residuary water still contains putrescible matter, and notably more ammonia than was in the sewage before being treated.

(*To be concluded next week.*)

STATE MEDICINE.

ILLINOIS STATE BOARD OF HEALTH.

The regular quarterly meeting of the Illinois State Board of Health was held in its rooms in the Capitol building at Springfield on Wednesday, July 2. 1884.

Present, at the afternoon session, Drs. Haskell, McKenzie, Kreider, and Rauch; Dr. Haskell presiding in the absence of the President; and, at the evening session, in addition to the above, Newton Bateman, the President, in the chair.

Dr. George N. Kreider, of Springfield, appointed to succeed Mr. Reen, of Peoria, resigned, was introduced to the members, and took his seat with the Board.

The minutes of the last quarterly meeting, April 17 and 18, were read and approved; after which the regular order of business was suspended, and the Board went into executive session on certain cases of colleges and practitioners under the Medical Practice Act.

During the evening session, the following quarterly report of the Secretary was presented:

QUARTERLY REPORT OF THE SECRETARY, APRIL 1,—JUNE 30, 1884.

During the quarter ended June 30, 1884, there were received in the Secretary's office 604 communications, letters, papers, etc., exclusive of 107 diplomas submitted for verification, and the affidavits and other papers accompanying applications for certificates in 226 cases. There were sent out, during the same period, 827 letters, postals, circulars, etc., and other communications, and the usual quantity of the Board's publications—reports, registers, preventable-disease circulars, epidemic disease blanks, forms of ordinances, etc. Two hundred and forty-two packages were received, and 212 sent out, by express. Seventy-three telegrams received, and 102 sent.

Certificates entitling to practice medicine and surgery, under the Medical-Practice Act, were issued to 170 graduates upon diplomas of colleges which have complied with the requirements of the Board, entitling them to be classed as in good standing, and to 4 upon length of practice in the State. Under the authority conferred upon the Secretary at the last meeting, seventeen applicants for certificates, holding diplomas of colleges which had not fully complied with the Board's requirements, have been notified that they would have to submit to examinations on the branches or subjects omitted by their respective schools. In nine of these cases, the applicants have already been examined and certificates issued; five of these were examined in hygiene only; three in hygiene and general education; and one on all the branches, including general education. Three

declined to appear to be examined, and have left the State, and the remaining five are now awaiting their examination.

Examinations of five midwives have been made, and certificates issued to three of these who passed successfully, and seven to others upon diplomas and licenses, or other recognized credentials.

MEDICAL EDUCATION.

At the annual meetings of the various medical organizations, State and National, which have been held during the past three months, the subject of the preliminary education of medical students has received more than usual attention. Almost unanimously, the individual members of the profession, and these various organizations as units (with one single exception), have pronounced in favor of exacting proof of proper preliminary education before admitting candidates to the lecture classes. There is, practically, no opposition to the movement, the only dissentients now remaining being a few members of college faculties influenced, probably, by a fear of diminished classes. With few exceptions—and these diminishing in number from time to time—the better class of colleges have already adopted this requirement. Every announcement for the session of 1884-85, thus far received, makes this a distinctive feature, but it is to be wished that the colleges would state specifically in their announcements the kind of examinations applicants would be subjected to, or the proof of fitting education required, instead of merely saying, as some of them do, "a preliminary education is required."

As illustrating the widespread influence of the effort to heighten the standard of professional acquirements, it may be stated that, at a recent meeting of the Nebraska State Medical Society, the qualifications for admission to membership were so amended as to require that applicants must be graduates of colleges which in all respects conform to the standard of minimum requirements of this Board.

In the further interest of medical education, I think it the duty of the Board to exert its influence toward securing legislation for the proper and adequate supply of material for the study of practical anatomy. Colleges in this State have been embarrassed, during the past year or two, in their efforts to properly instruct their students in this most important branch; and the difficulty is increasing. Surgical knowledge and skill cannot be acquired without an intelligent, practical study of anatomy; and in order to secure this, the methods and sources of the supply of material need to be more definitely recognized and regulated by law.

THE PUBLIC HEALTH.

Scarlet fever and small-pox prevailed to some extent during the first half of the quarter, mainly in the southern portion of the State. Except the few cases in Chicago and those in Kendall county, all the small-pox cases occurred in the south half of the State, but scarlet fever was more generally diffused. Both diseases have been of a mild type, with a moderate death rate. As the season advanced there has been the usual increase in the diseases of hot weather, but not characterized by any noteworthy features.

With regard to further action concerning small-pox, in view of the probability of its epidemic spread from abroad, as shown by its increased prevalence in London and elsewhere, and its frequent introduction into the State from neighboring States, I would suggest that it is desirable to call the attention of sanitary authorities and others to these facts and to the experience of the last few months, which shows that when the disease is introduced into a community where vaccination and re-vaccination were not thoroughly carried out during the recent epidemic, there is still danger of serious trouble. It is also important that county superintendents, school boards and others interested, should have their attention again directed to the fact that the school vaccination order of the board is permanent and continuous, and that its thorough enforcement is expected so as to prevent any accumulation of unprotected or imperfectly protected scholars, from term to term. To this end I think it necessary to again print and distribute copies of the order, with necessary instructions, together with supplies of certificates and blanks for returns to be made through the county superintendent by the first of January next.

Cases of glanders and other infectious diseases among animals continue to be reported to the Board. On the 28th of June Dr. C. N. Cooper, of Batavia, Kane county, reports having a patient under treatment, suffering with glanders, and wishes instructions and advice as to his actions. The amended pleuro-pneumonia and glanders act has by no means relieved the Board of responsibility in these cases. The public naturally apply to the health authorities in matters pertaining to health, and thus far the State Veterinarian is only reached in a large number of cases through this office. Whether further legislation is necessary on this subject, and what form it should take, are matters which seem to require the consideration of the members.

CHOLERA.

An epidemic spread of Asiatic cholera now seems imminent. What is known as the Damietta outbreak failed to secure a foot-hold in Europe last year, and with the exception of a few isolated cases in Russia and one fatal case at the Smyrna lazaretto—all in July of 1883—it is believed that the disease, from this outbreak was confined to the delta of the Nile. France, it is true, was threatened by the arrival at Havre, of the steamer St. Bernard in June last, with one case on board; but preventive measures were successfully instituted on that occasion and the evil then averted. About the first of May, 1883, the British troop ship, Crocodile, was reported in quarantine at Portsmouth, England, having then had eight cases of cholera on board, six of which proved fatal; but on this occasion also the disease seems to have been confined to the infected vessel. The French have been less successful in their recent precautionary attempts, if it be true, as is now alleged, that the Toulon outbreak was due to a fatal case on board the transport Montebello from China—the infected

clothing of the case not being destroyed. Later advices state that the disease was brought from Egypt in the troop-ship Sarthe. It has already spread to Marseilles and the villages above Toulon, and cases are reported in Italy and elsewhere.

Whether the disease will cross the Atlantic from the east will largely depend, of course, upon the efficiency of the measures employed to confine the contagion to its present localities. Very general activity is manifested by all the European governments and sanitary authorities; and it is to be hoped that they may prove successful, although the dissenting opinions of the English authorities as to quarantine may lead to friction between them and the continental authorities. Meanwhile we are threatened not only from Europe, but from the opposite side of the globe, cholera seeming to be spreading in China, and to have broken out in Japan.

In view of this condition of affairs I have thought it my duty, on behalf of the Board, to urge that the organization of the National Board of Health should be maintained, and have advised to that effect, hoping that it may be possible to still secure the necessary appropriation for this purpose in the Sundry Civil Service bill. Should cholera continue to spread on the Continent it is more than likely to find an entrance into this country, despite the efforts which may be made by local and State authorities to exclude it by quarantine regulations. Want of uniformity, failure to coöperate, commercial considerations, and local conditions, all combine to impair the efficiency of any system of quarantine; and to the extent that these obtain, in the absence of a uniform system, is the danger of failure increased. The remedy, of course, is in the National control and administration of quarantine; and the present emergency furnishes another argument for the continuance of the National Board of Health, with adequate appropriations and increased power and authority.

As to what should be done by us as a Board in the present aspect of affairs, I would say that my own experience and observation lead to the conclusion that it is not judicious to place entire reliance on quarantine measures, no matter how administered, should the disease become epidemic in countries or ports with which this country has close commercial relations. Asiatic cholera, although it may invade places in good sanitary condition, finds its most congenial habitat where filth, in any form, abounds. The best attainable sanitary condition—clean streets and premises; the prompt and proper disposal of organic refuse, night-soil and all forms of sewage; well ventilated habitations with dry, clean basements; a pure and sufficient water-supply; and good individual hygiene, including personal cleanliness, a proper diet, and regular habits of life, these are the best safe-guards against Asiatic cholera, as they are against most diseases. If it should unfortunately appear in a locality whose sanitary condition is good, as thus outlined, there is every reason to anticipate its prompt arrest by well understood measures—thorough isolation of cases, disinfection of discharges, etc. Cholera is pre-eminently a disease to be fought by sanitation.

THE FIFTH ANNUAL REPORT.

Continued delays in the public printing office have still further postponed the publication of the fifth annual report of the Board; but a full force of compositors is now at work upon it, and assurance is given of its speedy completion.

The material for the sixth annual report is in an advanced state of preparation, and, together with the revised official register of physicians and midwives, which is also nearly ready, will be put into the printer's hands as soon as the fifth annual is out of the way.

All of which is respectfully submitted.

JOHN H. RAUCH, Secretary.

At the conclusion of the reading of the Seretary's report, which was accepted and ordered placed on file, the following resolutions were adopted, looking to putting into effect the various suggestions embodied in the report:

Resolved, That the importance of the study of practical anatomy, as a foundation for surgical knowledge and skill, demands that the supply of material for this study be more definitely regulated, and its necessity recognized by law, and that the Illinois State Board of Health respectfully urges the attention of law-makers to these considerations.

Resolved, That the increasing prevalence of small-pox in London and elsewhere, indicating a probable renewal of this epidemic tendency, and its frequent introduction into Illinois from neighboring States within the past few months, make it desirable that vaccinal protection be secured as fully as possible in every portion of the State; and to this end the Secretary is hereby authorized to call the attention of sanitary authorities and others to the subject, and to take the necessary steps to push the further enforcement of the school-vaccination order of the Board, so that all new scholars, and those who have not heretofore fully complied with its provisions, may be properly protected against small-pox before the advent of cold weather.

Resolved, That while epidemic cholera may be excluded from this country by thoroughly-enforced quarantine regulations, yet the best attainable sanitary conditions of every locality in the State should be secured, so that, in the event of Asiatic cholera effecting an entrance notwithstanding quarantine, the disease may be met and fought under the most favorable circumstances; the Secretary is, therefore, hereby authorized to take such action as, in his judgment, will most promptly obtain a thorough sanitary organization of the State, and the adoption and enforcement of the measures necessary to improve its general sanitary condition.

On motion of Dr. Haskell, the Secretary was given discretionary authority to act for the Board in any case of emergency which may arise in the interims between the regular meetings,

During the executive session the cases of a number of colleges, with reference to the requirements of the Board and their standing under the Medical Practice Act; the important features of the office correspondence during the quarter, and the cases of a number

of practitioners, were considered, and the necessary action was taken in a large number of these. The following certificates were also ordered to be revoked:

Certificate No. 913, issued to Peleg W. Blakeley.
Certificate No. 1,103, issued to Fritz Tripple.
Certificate No. 4,027, issued to William Becker.
Certificate No. 3,190, issued to S. Meyer.

After the transaction of sundry routine business, auditing of accounts, etc., which occupied the hours of the morning session, the Board, at 11:30 A. M., adjourned.

BOOK REVIEWS.

CLINICAL LECTURES ON MENTAL DISEASES. By T. P. CLOUSTON, M.D. Edin. F.R.C.P.E., Phys. Supt. Royal Edinburgh Asylum for the Insane. Lecturer on Mental Disease Edinburgh University *etc., etc.* Philadelphia 1884, H. C. Lea's Sons, pp. 550.

To this English work the publishers have added, in the American edition, an abstract of the Statutes of the United States and of the several states and territories relating to the custody of the insane, compiled by Charles F. Folsom, M. D., of Harvard Medical school.

Local laws are so much at variance that perplexing questions are at any time liable to confront the practitioner who has not at hand some such guide to the legal regulations governing these matters.

The body of the work—433 pages in all—is a clinical study of mental diseases of the commoner types based on a wide experience and supplemented by ample statistics.

The subject is treated from so entirely a practical standpoint as to lack something of the fulness of a systematic work, particularly in the line of the history of investigation and the works of other authors.

An effort is made to present the subject attractively by appealing directly to the facts of the pathology and dispensing with elaborate description.

Two hundred and sixty cases from Dr. Clouston's own practice are carefully and critically examined. Seven colored lithographic plates of unusually fine execution add to the value of the book.

Typical cases of insanity rather than rare and unusual forms are for the most part selected for illustrations.

This book is to be commended highly for the clearness of its style and its telling array of cases. The latter are so introduced in the body of the descriptive passages as to make a very attractive combination of didactic and narrative writing. The work will become a standard one on both sides of the Atlantic.

PRACTICAL PATHOLOGY, A MANUAL FOR STUDENTS AND PRACTITIONERS. By G. SIMS WOODHEAD, M.D., F.R.C.P.E. Published by Henry C. Lea's Son & Co., Philadelphia.

This most excellent work does not purport to be a systematic treatise on Pathology, but a guide to the practical work involved in the study, preparation, and examination of morbid tissues. The more important changes of each organ are described and illustrated, though all the changes which occur could not possibly be considered in the space devoted to the work. The plan of the work follows the various organs and tissues from the postmortem table to the microscope. The first chapter treats of postmortem examinations, the instruments needed and modes of procedure. The second chapter describes very briefly the microscope, for some prior knowledge of this is advised and taken for granted; and gives directions for its use both in examining fresh and prepared tissues. It tells fully how to make injections, how to harden and cut tissues, and discusses clearly the merits of, and describes the methods of using, the common and best staining fluids. The author advises the use of the freezing microtome as enabling the busy student to avoid waste of time in learning to cut sections by hand. Microtomes are now made cheaply, and with a couple of days' practice excellent sections can be made. In regard to staining fluids, picrocarmine is deservedly the favorite with our author. Full details are given of how to make and use the various staining reagents. With the next chapter the consideration of the different organs of the body is begun.

In this short review we cannot consider the remaining chapters. They give clearly a description of the microscopical appearances of the various lesions, and then minute directions for each step in the preparation of the diseased tissue for microscopical examination, and its appearance when examined.

The last chapters discuss the common parasites, both animal and vegetable.

Among the chief and most praiseworthy features of the work are its illustrations. The cuts are not mere diagrams, but accurate drawings. Many of them are original. They are also colored so as to accurately represent the stained tissue.

This book is worthy of much praise, and will without doubt be found of the greatest assistance to those beginning to do practical pathological work. And even those accustomed to the use of the microscope and its aecessaries will find in it many valuable hints. It is to be hoped that the work will contribute much to make popular, practical pathology.

MEDICAL GERMAN, By Solomon Deutsch, A.M., P.L.D. J. H. Vail & Co., Publishers.

This book is intended to aid the physician in his intercourse with German patients and in reading German medical works. It will be found useful both by those who possess only an elementary knowledge of German and by those more advanced in its study.

The text is separated into two main divisions. The first is practically a glossary of medical terms and words likely to be used in conversation with the sick. The second consists of conversations, questions and answers. There are also German and English indexes which contain nearly 1,400 words.

The utility of such books is undeniable, but they only supplement a study of the grammar and literature. They can not supplant it.

FOREIGN CORRESPONDENCE.

LONDON LETTER.

LONDON, JUNE, 1884.

No doubt many who intend visiting the meeting of the Medical Congress to be held at Copenhagen in August, will avail themselves of the offer of the Ocean Steam Yachting Company to take passengers to the meeting in their steam yacht "Ceylon" for a fare of £30 each person, this to include living on board in port, table wine, and boat service. This arrangement sounds pleasant, and will obviate the discomfort of living in crowded hotels.

Since the suspension of the Contagious Diseases Acts, the various female Lock Hospitals in the towns where the acts were previously enforced seem to have been practically empty, whilst the percentage of venereal diseases amongst the troops seems to be on the increase, in spite of the assertion of those opposed to the working of the Contagious Diseases acts. A deputation of gentlemen opposed to state interference with prostitution have waited on the Home Secretary at the House of Commons and presented a memorial asking the complete and unconditional abandonment of the Acts. The deputation was informed that resolutions of the Justices of Plymouth and from the Grand Jury at Colchester, as well as from the authorities at our other chief military stations, had been received, deploring the increase of immorality and the growth of the want of decorum in public thoroughfares. This the deputation did not agree with, and upon withdrawing undertook to oppose any proposal to re-introduce the acts. It is to be regretted that a small section should be so bent upon doing away with such a useful measure as the acts proved themselves to be during many years.

The cold weather that Western Europe is having has caused many to delay their return from the Mediterranean "littoral." It is to be hoped that those answerable for the "wagon lits" service have taken precautions to have reserve carriages in case of any accident, as at the beginning of the season many invalids, who had paid for proper accommodation on the journey, too often were hurried into ordinary carriages *en route*, through some slight mishap to the saloon in which they started necessitating its being left behind at some stopping-place. Another complaint was that more tickets were issued than compartments were provided.

The Westminster Hospital has one of its wards decorated by the lady members of the Kyrle Society. The walls have been painted representing the four seasons, and have a most cheerful aspect. The Society is to be congratulated upon its success in this case, and if its example is followed in other institutions, it will be a great boon to those who have to spend many weary hours within their walls.

At the annual meeting of the London Anti-Vivisection Society, the committee announced the financial position of the society to be very flourishing. One of the speakers remarked that science only claimed to have been successful in six or seven points from vivisection, while its advocates did not deny that four or five of these might not have been brought about by other means. Dr. T. G. Vawdrey proposed and carried the following resolution: "That vivisection as a method of scientific investigation is erroneous in theory and misleading in practice, and ought to be prohibited." He said vivisection is erroneous in theory, because it rested on the false assumption that experiments on animals might be applied to the purposes of man. Experimenters could never be certain whether the result of their experiments would be applicable to man, and although they were sometimes, in most cases they were not. At the conclusion of the meeting, a petition embodying the views of the society, for presentation to Parliament, was agreed to.

The general hospital at Peterborough has been destroyed by fire, and the hundred patients who were in it at the time, had a very narrow escape. Within half an hour of the outbreak the building was a mass of flames. One patient was under chloroform undergoing an operation, when the alarm was given.

It is stated that a new edition of the Dictionary of Medicine, edited by Dr. Quain, is going to be brought out. No dictionary of medicine so compendious, and at the same time so authoritative, has yet appeared in any language. Each contributor "volunteered or was invited to write on a subject with which he was specially familiar," and the list of authors is as representative of the best literature of the profession in England, Ireland, and Scotland, as any that could have been framed. If the name of a distinguished authority is missed here and there, this is only the inevitable result of there being other, and sometimes younger men, equally qualified and more conveniently situated for the purpose. A sense of proportion in assigning the space to the several subjects in a vast field of knowledge must be constantly and watchfully observed, along with due consideration for the value of everything that a distinguished contributor would wish to write on his favorite theme. It is given only to a firm hand and a delicate tact to achieve success in such an enterprise, and the measure of Dr. Quain's success must be, on the one hand, the compact form and size of his dictionary, and on the other, the endless variety of the articles and the value of the signatures that they bear.

It may not be generally known that Dr. Laennec, of Paris, in 1819, first made use of a "new method" for exploring the state of the heart and lungs.

Laennec related to one of his friends the story of his discovery. Walking through the court of the Louvre, he observed some children amusing themselves by holding a cylindrical piece of wood to the ear and scratching with a pin on the further end of it, whereby they produced a noise louder than the scratching of a pin produces under ordinary circumstances. Next morning, visiting his patients in the Hospital Necker, he extemporized a hollow cylinder out of a roll of paper, and applied it over the heart of one of his

patients. This was the first stethoscope which he used for some time, afterward superseding it by one made of cedar-wood. He published a treatise on mediate auscultation in 1819. After a short period of indifference, the method began to be warmly taken up, notably by Dr. John Forbes, and Dr. Stokes, of Dublin, and in a thoroughly scientific spirit by Dr. C. I. B. Williams, who published his "Rational Exposition of the Physical signs of the Diseases of the Lungs and Pleura" in 1830, and who still lives to connect the generation of Laennec with the present.

The appointment to the newly instituted University Professorship of Pathology at Cambridge has taken place, the electors being the Vice-Chancellor, Professor Foster, Dr. Gaskell, Dr. Humphrey, Sir I. Paget and Dr. J. B. Sanderson. Their choice fell upon Charles Smart Roy, M.D., who graduated at Edinburgh in 1875. The endowment is £800 a year exclusive of fees. The holder is not allowed to undertake private practice of medicine and surgery.

G.O.M.

DOMESTIC CORRESPONDENCE.

FROM WASHINGTON.

MEDICAL MATTERS BEFORE CONGRESS—MEDICAL INSPECTORS AT FOREIGN CONSULATES—July 2.—The Sundry Civil Appropriation Bill as before the United States Senate, contains the following clause which was adopted. Expenses of State Department. To enable the Secretary of State to appoint from time to time for such period as is absolutely necessary, medical inspectors to be attached to the United States Consulates in countries where yellow fever, cholera or plague exist in epidemic form, $10,000.

NATIONAL BOARD OF HEALTH.—The same bill contains a clause, which was passed to the effect of striking out the existing clause, "That all laws or parts of laws authorizing the appointment of a National Board of Health be, and the same are hereby repealed;" and to insert, "For pay and expenses of the members of the National Board of Health, $8,000; and for the investigation of questions affecting the public health, $10,000."

July 3, in the House of Representatives, the following report from the Committee on Printing (a joint resolution) was passed:

Report from the Committee on Printing on joint resolution (H. Res. 260,) authorizing the printing and binding of additional copies of the reports of the National Board of Health:

The reports for the years 1880, 1881, and 1882, of the National Board of Health contain many valuable papers, covering the results of long-continued and careful investigation in matters affecting the public health. These investigations have been made by men the most eminent in their several lines of study, and it is gratifying to be able to state that the leading sanitarians, both of this country and of Europe, agree in their estimate of the extraordinary value of the service thus rendered by the board. The reports embrace the results of investigations into yellow fever, cholera, diphtheria, the sanitary condition of our summer resorts, the effect produced upon water by its filtration through soils, the sewerage systems of Europe, the flow of sewers, and the analysis of water, together with reports on many other subjects relating to the public health.

The report on water analysis is regarded by all competent judges to be the most complete and valuable inquiry into the sanitary relations of potable water which has yet been made.

The report on the filtering capacity of soils made under the direction of Professor Raphael Pumpelly, of the Geological Survey, has awakened the liveliest interest among sanitarians all over the world, and has been pronounced to be one of the most important contributions ever made, to our knowledge, of the propagation of epidemic diseases.

The report on the sewerage systems of Europe gives in detail the general systems and their application, together with their cost of construction and maintenance in the principal cities of Europe.

The subject of city and town sanitation is now attracting attention throughout the country, and all reports bearing upon sewerage, water supply, etc., are eagerly sought for.

It is unnecessary to refer in detail to all of the investigations made by the board. The constant demand for them from engineers, health authorities, students in colleges, and sanitarians both in this and foreign countries fully attests their value.

Of the reports published since that for 1879, only the usual number has been printed and the supply of those for 1880 and 1881 has been exhausted, while the report for 1882 has but recently been delivered.

In view of the importance of the subjects treated, and of the great value of the contributions thus made to the general knowledge of sanitary subjects, the board has had its reports stereotyped in order that the cost of reproduction might be reduced to the lowest possible point. The public printer estimates that it will cost $3,426 to print the number of copies of the reports for the years 1880, 1881, and 1882, called for in the resolution.

Your committee is of the opinion that every effort to improve the sanitary condition of the people should be fostered.

In view, therefore, of the importance of these reports in the addition which they make to our knowledge of sanitary subjects, we recommend the adoption of the resolution.

A. HERR SMITH.

The joint resolution was read, as follows:

Resolved by the Senate and House of Representatives, etc., That the public printer be, and he is hereby authorized to print and bind for use of the National Board of Health 1,000 copies of each of its annual reports, beginning with the year 1880.

MEDICAL AND SURGICAL HISTORY.—July 3.—Mr. Scales from the Committee on Printing introduced the resolution which passed: That the public printer is hereby authorized to print and bind in the usual style 5,000 additional copies of the Medical and Surgical History of the War of the Rebellion, all of which are to be sold to applicants at cost with 10 per cent. added. Provided that not more than one copy of each volume shall be sold to any one person.

MENOXENIA.

EDITOR JOURNAL:

The case of menoxenial anarrhœa recently mentioned in the JOURNAL calls to mind a somewhat similar instance in Pennsylvania, now of some eight years' standing, where the horæal profluvium was effected by exspuition instead of by the usual mode. If the source of the catamenial issue was bronchial, it seemed to be very low, and at, or near the pulmonary confluence; evidently the flow was not from the epigastrium. Permanent acyesis ensued, but general health of subject remained good.

Respecting appliances described for better treatment of hepatic ecpyesis, it would seem that by the invagination of the drainage-tube within an auliscus

already internally smeared with pus, some of the latter must adhere to the external surface of the drainage-tube, and be subject of (possible) injury by absorption.

The comments of the JOURNAL relative to proposed congressional aid for the permanent abatement of yellow fever are clearly well taken and particularly apropos. If in addition to the appropriation as suggested, some private individual like Vanderbilt would in the fullness of his heart (and purse) seek to immortalize himself by an offer of say one million dollars for fruition, pursuit would be stimulated and success seem more hopeful. After all, however, may not that pyretic scourge be master by aid of heat, filth, and overcrowding? "Frost kills yellow fever," it has been said; but frost will not come at the bidding where the fever may be worst. Let the best, however, be hoped for; man is becoming better and better able to grapple with mighty problems which concern the welfare of mankind.

SPHEX.

Chicago, June, 1884.

REPORT OF A CASE OF FLOATING CARTILAGE IN THE KNEE JOINT.

MECHANICSVILLE, IOWA, June 30, 1884.

M. F. L., 19 years of age, consulted me last September (15) for some "knee joint trouble," giving a history of a fall some six months previous, with injury to the knee, which gave but little trouble at the time. Some three months after the accident, he was suddenly taken with pain and loss of motion, suffering several weeks before relieved. This occurred some three times before he came to consult me. The diagnosis was easily made, as the cartilage could be felt.

I decided to operate for its removal. Æther; antiseptic precautions except spray. Apply bloodless bandage, pressing the cartilage far up the external border of the tendon quadriceps, and securing it in position by very elastic fine rubber tubing. Flexing the knee, I made a valvular incision down upon the upper border of the cartilage.

Opening the sac, the cartilage passed out into the incision and was removed. After all bleeding ceased, sewed up the wound, and dressed it by placing over knee a large sponge wrung out of a carbolic acid solution, and keeping it wet. Placed leg in a well-fitting splint, applying ice to keep the parts at a low temperature.

Dressed the wound in 72 hours. Found wound healed by first intention. No swelling or tenderness about wound or joint. Three days later patient returned home, some 150 miles distant.

That which I wish particularly to call the attention of the profession to, is the use of the rubber bandage to fix the cartilage, and also as a means of excluding all air or blood from the sac.

Immediately upon the escape of the cartilage, the sac receded under the tubing, and it would seem impossible for the air, blood, or contaminating germs to enter. In thus handling these cases, I believe at least one of the great sources of danger can be avoided.

Yours respectfully,

J. K. MILBOURNE, M.D.

MISCELLANEOUS.

OFFICIAL NOTICE.

ANNUAL DUES from members of the Association—*Five Dollars* per annum—are payable directly to the Treasurer. Such payment entitles them to receive the JOURNAL of the Association for one year.

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THE INDEX to the 33 Volumes of Transactions will be forwarded, postpaid, on receipt of *One Dollar* by the Treasurer.

According to a resolution passed May 9, 1884, at the Washington meeting, continuous payment of Annual Dues is required, to retain permanent membership.

RICHARD J. DUNGLISON, M.D.,
Treasurer.

Lock Box 1274, Philadelphia, Pa.

LIST OF OFFICIAL CHANGES IN THE MEDICAL CORPS OF THE NAVY, FOR THE WEEK ENDING JULY 19, 1884.

Medical Director A. L. Gihon, ordered as member of Board of Inspection.

P. A. Surgeon R. C. Persons, ordered to U. S. S. "Saratoga."

P. A. Surgeon C. A. Seigfried, detached from U. S. S. "Saratoga," ordered to Naval Hospital, Brooklyn.

Assistant-Surgeon J. S. Sayre, ordered to U. S. S. "Independence."

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT UNITED STATES ARMY, FROM JULY 12, 1884, TO JULY 18, 1884.

Clements, B. A., Major and Surgeon, also directed to relieve Surgeon J. P. Wright of his duties as Acting Medical Director, Dept. of the Missouri. (Par. 1, S. O. 138, Hdqrs. Dept. of Mo., July 8, 1884.)

McElderry, Henry, Captain and Assistant-Surgeon, from Dept. of the Platte to Dept. of the East. (Par. 12, S. O. 165, A. G. O., July 16, 1884.)

Ewen, Clarence, Captain and Assistant-Surgeon, assigned to duty as Post Surgeon, Fort Sidney, Neb. (Par 8, S. O. 58, Hdqrs. Dept. of Platte, July 11, 1884.)

Elbrey, F. W., Captain and Assistant-Surgeon, leave of absence still further extended 6 months on surgeon's certificate of disability. (Par. 6, S. O. 161, A. G. O., July 12, 1884.)

Wakeman, Wm. J., First Lieutenant and Assistant-Surgeon, relieved from duty at Fort D. A. Russell, Wyo., and assigned to duty as Post Surgeon, Fort Washakie, relieving Assistant-Surgeon Norton Strong. (Par. 9, S. O. 58, Hdqrs. Dept. of Platte, July 11, 1884.)

Appointment—Charles B. Ewing, to be Assistant-Surgeon with the rank of First Lieutenant, July 5, 1884, vice Middleton, promoted. (Memo., A. G. O., July 14, 1884.)

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